



## SEQUENCE LISTING

<110> Microtechnics Limited  
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Wells, Jeremy M  
Hanniffy, Sean B

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<140> PCT/GB99/02444

<141> 1999-07-27

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<151> 1998-07-27

<150> US 60/125163

<151> 1999-03-19

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<170> PatentIn Ver. 2.1

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<211> 1250

<212> PRT

<213> Streptococcus agalactiae

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Phe Leu His Ser Pro Gln Val Phe Ala Glu Glu Val Ser Val Ser Pro  
35 40 45

Ala Thr Thr Ala Ile Ala Lys Ser Asn Ile Asn Gln Val Asp Asn Arg  
50 55 60

Gln Ser Thr Asn Leu Lys Asp Asp Ile Asn Ser Asn Ser Glu Thr Val  
65 70 75 80

Val Thr Pro Ser Asp Met Pro Asp Thr Lys Gln Leu Val Ser Asp Glu  
85 90 95

Thr Asp Thr Gln Lys Gly Val Thr Glu Pro Asp Lys Ala Thr Ser Leu  
100 105 110

Leu Glu Glu Asn Lys Gly Pro Val Ser Asp Lys Asn Thr Leu Asp Leu  
115 120 125

Lys Val Ala Pro Ser Thr Leu Gln Asn Thr Pro Asp Lys Thr Ser Gln  
130 135 140

Ala Ile Gly Ala Pro Ser Pro Thr Leu Lys Val Ala Asn Gln Ala Pro  
145 150 155 160

Gln Ile Glu Asn Gly Tyr Phe Arg Leu His Leu Lys Glu Leu Pro Gln  
165 170 175

Gly His Pro Val Glu Ser Thr Gly Leu Trp Ile Trp Gly Asp Val Asp  
180 185 190

Gln Pro Ser Ser Asn Trp Pro Asn Gly Ala Ile Pro Met Thr Asn Ala  
195 200 205

Lys Lys Asp Asp Tyr Gly Tyr Tyr Val Asp Phe Lys Leu Ser Glu Lys  
210 215 220

Gln Arg Lys Gln Ile Ser Phe Leu Ile Asn Asn Lys Ala Gly Thr Asn  
225 230 235 240

Leu Ser Gly Asp His His Ile Pro Leu Leu Arg Pro Glu Met Asn Gln  
245 250 255

Val Trp Ile Asp Glu Lys Tyr Gly Ile His Thr Tyr Gln Pro Leu Lys  
260 265 270

Glu Gly Tyr Val Arg Ile Asn Tyr Leu Ser Ser Ser Gly Asn Tyr Asp  
275 280 285

His Leu Ser Ala Trp Leu Phe Lys Asp Val Ala Thr Pro Ser Thr Thr

290	295	300
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Ile Asp Val Pro Leu Lys Thr Asn Ala Lys Glu Ile Gly Phe Leu Ile 325 330 335		
Leu Asp Glu Ser Lys Thr Gly Asp Ala Val Lys Val Gln Pro Asn Asp 340 345 350		
Tyr Val Phe Arg Asp Leu Ala Asn His Asn Gln Ile Phe Val Lys Asp 355 360 365		
Lys Asp Pro Lys Val Tyr Asn Asn Pro Tyr Tyr Ile Asp Gln Val Gln 370 375 380		
Leu Lys Asp Ala Gln Gln Thr Asp Leu Thr Ser Ile Gln Ala Ser Phe 385 390 395 400		
Thr Thr Leu Asp Gly Val Asp Lys Thr Glu Ile Leu Lys Glu Leu Lys 405 410 415		
Val Thr Asp Lys Asn Gln Asn Ala Ile Gln Ile Ser Asp Ile Thr Leu 420 425 430		
Asp Thr Ser Lys Ser Leu Leu Ile Ile Lys Gly Asp Phe Asn Pro Lys 435 440 445		
Gln Gly His Phe Asn Ile Ser Tyr Asn Gly Asn Asn Val Thr Thr Arg 450 455 460		
Gln Ser Trp Glu Phe Lys Asp Gln Leu Tyr Ala Tyr Ser Gly Asn Leu 465 470 475 480		
Gly Ala Val Leu Asn Gln Asp Gly Ser Lys Val Glu Ala Ser Leu Trp 485 490 495		
Ser Pro Ser Ala Asp Ser Val Thr Met Ile Ile Tyr Asp Lys Asp Asn 500 505 510		
Gln Asn Arg Val Val Ala Thr Thr Pro Leu Val Lys Asn Asn Lys Gly 515 520 525		
Val Trp Gln Thr Ile Leu Asp Thr Lys Leu Gly Ile Lys Asn Tyr Thr 530 535 540		
Gly Tyr Tyr Tyr Leu Tyr Glu Ile Lys Arg Gly Lys Asp Lys Val Lys 545 550 555 560		
Ile Leu Asp Pro Tyr Ala Lys Ser Leu Ala Glu Trp Asp Ser Asn Thr 565 570 575		
Val Asn Asp Asp Ile Lys Thr Ala Lys Ala Ala Phe Val Asn Pro Ser 580 585 590		
Gln Leu Gly Pro Lys Asn Leu Ser Phe Ala Lys Ile Ala Asn Phe Lys		

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Ala	Ala	Phe	Ser	Glu	Lys	Leu	Asp	Tyr	Leu	Gln	Lys	Leu	Gly	Val	Thr
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His	Ile	Gln	Leu	Leu	Pro	Val	Leu	Ser	Tyr	Phe	Tyr	Val	Asn	Glu	Met
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Asp	Lys	Ser	Arg	Ser	Thr	Ala	Tyr	Thr	Ser	Ser	Asp	Asn	Asn	Tyr	Asn
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705					710					715					720
Ile	His	Asp	Ile	His	Lys	Arg	Gly	Met	Gly	Val	Ile	Leu	Asp	Val	Val
			725						730					735	
Tyr	Asn	His	Thr	Ala	Lys	Thr	Tyr	Leu	Phe	Glu	Asp	Ile	Glu	Pro	Asn
			740					745					750		
Tyr	Tyr	His	Phe	Met	Asn	Glu	Asp	Gly	Ser	Pro	Arg	Glu	Ser	Phe	Gly
		755					760					765			
Gly	Gly	Arg	Leu	Gly	Thr	Thr	His	Ala	Met	Ser	Arg	Arg	Val	Leu	Val
		770				775					780				
Asp	Ser	Ile	Lys	Tyr	Leu	Thr	Ser	Glu	Phe	Lys	Val	Asp	Gly	Phe	Arg
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Phe	Asp	Met	Met	Gly	Asp	His	Asp	Ala	Ala	Ala	Ile	Glu	Leu	Ala	Tyr
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Lys	Glu	Ala	Lys	Ala	Ile	Asn	Pro	Asn	Met	Ile	Met	Ile	Gly	Glu	Gly
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Lys	Ser	Ile	Asn	Lys	Asp	Pro	Lys	Val	Ala	Glu	Glu	Asp	Ile	His	Arg		
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Phe	Ile	His	Ser	Gly	Gln	Glu	Tyr	Gly	Arg	Thr	Lys	Arg	Leu	Leu	Asn		
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Pro	Asp	Tyr	Met	Thr	Lys	Val	Ser	Asp	Asp	Lys	Leu	Pro	Asn	Lys	Ala		
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Thr	Leu	Ile	Glu	Ala	Val	Lys	Glu	Tyr	Pro	Tyr	Phe	Ile	His	Asp	Ser		
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Gly	Asp	Ile	Lys	Glu	Lys	Asp	Leu	Val	Ile	Ala	Tyr	Gln	Thr	Ile	Asp		
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Val	Ile	Val	Asp	Ala	Asp	Gln	Ala	Gly	Ile	Lys	Pro	Ile	Ser	Thr	Pro		
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Arg	Gly	Val	His	Phe	Glu	Lys	Asp	Ser	Leu	Leu	Ile	Asp	Pro	Leu	Thr		
			1140						1145				1150				
Ala	Ile	Val	Ile	Lys	Val	Gly	Lys	Val	Ala	Pro	Ser	Pro	Lys	Glu	Glu		
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		1170					1175				1180						
Val	Glu	Lys	Val	Asn	Arg	Ile	Ala	Asn	Lys	Thr	Ser	Ile	Thr	Pro	Val		
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1205

1210

1215

Lys Thr Gly Asp Lys Ser Ser Lys Ile Leu Ser Val Val Gly Ile Ser  
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Arg Thr  
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 <213> Streptococcus agalactiae

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 ccaatgtatg cgatgacaaa agaagtatct ggagacctaa atgatgtgag gatgatccaa 180  
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 gcggtattgt ttgtttacca atcacatacc ttagaagctt gggcaaggga tctagaccct 300  
 aatttaaaaa aatcaaaggt taatgtgttt gaagcgtcaa aacctctgac actagataga 360  
 gtcaaagggc tagaagatat ggaagtcaca caaggcattg accctgacgac actttatgac 420  
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 <212> PRT  
 <213> Streptococcus agalactiae

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 Met Ser Val Val Thr Ser Phe Tyr Pro Met Tyr Ala Met Thr Lys Glu  
 35 40 45  
 Val Ser Gly Asp Leu Asn Asp Val Arg Met Ile Gln Ser Gly Ala Gly  
 50 55 60  
 Ile His Ser Phe Glu Pro Ser Val Asn Asp Val Ala Ala Ile Tyr Asp  
 65 70 75 80

Ala Asp Leu Phe Val Tyr Gln Ser His Thr Leu Glu Ala Trp Ala Arg  
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 Asp Leu Asp Pro Asn Leu Lys Lys Ser Lys Val Asn Val Phe Glu Ala  
                     100                    105                    110  
 Ser Lys Pro Leu Thr Leu Asp Arg Val Lys Gly Leu Glu Asp Met Glu  
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 Val Thr Gln Gly Ile Asp Pro Ala Thr Leu Tyr Asp Pro His Thr Trp  
                     130                    135                    140  
 Thr Asp Pro Val Leu Ala Gly Glu Glu Ala Val Asn Ile Ala Lys Glu  
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 Leu Gly His Leu Asp Pro Lys His Lys Asp Ser Tyr Thr Lys Lys Ala  
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 Lys Ala Phe Lys Lys Glu Ala Glu Gln Leu Thr Glu Glu Tyr Thr Gln  
                     180                    185                    190  
 Lys Phe Lys Lys Val Arg Ser Lys Thr Phe Val Thr Gln His Thr Ala  
                     195                    200                    205  
 Phe Ser Tyr Leu Ala Lys Arg Phe Gly Leu Lys Gln Leu Gly Ile Ser  
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 Gly Ile Ser Pro Glu Gln Glu Pro Ser Pro Arg Gln Leu Lys Glu Ile  
                     225                    230                    235                    240  
 Gln Asp Phe Val Lys Glu Tyr Asn Val Lys Thr Ile Phe Ala Glu Asp  
                     245                    250                    255  
 Asn Val Asn Pro Lys Ile Ala His Ala Ile Ala Lys Ser Thr Gly Ala  
                     260                    265                    270  
 Lys Val Lys Thr Leu Ser Pro Leu Glu Ala Ala Pro Ser Gly Asn Lys  
                     275                    280                    285  
 Thr Tyr Leu Glu Asn Leu Arg Ala Asn Leu Glu Val Leu Tyr Gln Gln  
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 Leu Lys  
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 aatcaaagtc aaggtaatgt tttagagcgt cgccaacgtg atgcggaaaa caaaagtcag 180



ggtaatgttt tagagcgtcg ccaacgtgat gcggaaaaca agagccaagg caatgtttta 240  
 gagcgtcgtc aacgcgatgt tgagaataag agccaaggca atgttttaga gcgtcgtcaa 300  
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 aacaagagcc aagtaggtca acttataggg aaaaatccac ttttttcaaa gccaactgta 420  
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 gtatctcagg ttactaatgt agctaataga ccgatgttaa ctaataattc tagaacaatt 540  
 tcagtataaa ataaattacc taaaacaggt ggtgatcaaa atgtcatttt taaacttgta 600  
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<210> 14

<211> 218

<212> PRT

<213> Streptococcus agalactiae

<400> 14

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Leu Tyr Met Gly Val Leu Gly Ser Thr Ile Ile Leu Gly Ser Ser Pro  
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Val Ser Ala Met Asp Ser Val Gly Asn Gln Ser Gln Gly Asn Val Leu  
 35 40 45

Glu Arg Arg Gln Arg Asp Ala Glu Asn Lys Ser Gln Gly Asn Val Leu  
 50 55 60

Glu Arg Arg Gln Arg Asp Ala Glu Asn Lys Ser Gln Gly Asn Val Leu  
 65 70 75 80

Glu Arg Arg Gln Arg Asp Val Glu Asn Lys Ser Gln Gly Asn Val Leu  
 85 90 95

Glu Arg Arg Gln Arg Asp Ala Glu Asn Lys Ser Gln Gly Asn Val Leu  
 100 105 110

Glu Arg Arg Gln Arg Asp Ala Asp Asn Lys Ser Gln Val Gly Gln Leu  
 115 120 125

Ile Gly Lys Asn Pro Leu Phe Ser Lys Pro Thr Val Ser Arg Glu Asn  
 130 135 140

Asn His Ser Ser Gln Gly Asp Ser Asn Lys Gln Ser Phe Ser Lys Lys  
 145 150 155 160

Val Ser Gln Val Thr Asn Val Ala Asn Arg Pro Met Leu Thr Asn Asn  
 165 170 175

Ser Arg Thr Ile Ser Val Ile Asn Lys Leu Pro Lys Thr Gly Gly Asp  
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Gln Asn Val Ile Phe Lys Leu Val Gly Phe Gly Leu Ile Leu Leu Thr  
 195 200 205

Ser Arg Cys Gly Leu Arg Arg Asn Glu Asn  
 210 215

<210> 15  
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 <212> DNA  
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 attaaaaaag aaaaaagaga caagccggat aataaaaaagc aaatcagcga gacacttaaa 180  
 gttcctttaa aacccaaaaa agtagttgtt tttgatatgg gagctttgga tactatcaca 240  
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 ttgccaata acgtcaaatac tgtttataaa gctaagagat accaagacgt aggaagtctc 360  
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 caagctgttc ttaaattgca gaaaactatt gagaaaaaag gtaaacctac agctctattt 660  
 gtaatggcaa acagcgggtga acttttaact caatcacctt ctggtcgttt tggttggtatt 720  
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 cccgtatctt atgaatacat cgctgaaaaa aatcctaact atctctttgt tttagatcgt 840  
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<210> 16  
 <211> 342  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 16  
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 Ile Lys Asn Asn Tyr Ser Val Tyr Ile Lys Lys Glu Lys Arg Asp Lys  
 35 40 45  
 Pro Asp Asn Lys Lys Gln Ile Ser Glu Thr Leu Lys Val Pro Leu Lys  
 50 55 60  
 Pro Lys Lys Val Val Val Phe Asp Met Gly Ala Leu Asp Thr Ile Thr  
 65 70 75 80  
 Ala Leu Gly Ala Glu Lys Ser Val Ile Gly Ile Pro Lys Ala Lys Asn  
 85 90 95  
 Ala Leu Ser Leu Leu Pro Asn Asn Val Lys Ser Val Tyr Lys Ala Lys  
 100 105 110  
 Arg Tyr Gln Asp Val Gly Ser Leu Phe Glu Pro Asn Phe Glu Ala Ile

115	120	125
Ala Arg Met Gln Pro Asp Val Val Phe Leu Gly Ala Arg Met Ala Ser 130 135 140		
Val Asp Asn Ile Glu Lys Leu Lys Glu Ala Ala Pro Lys Ala Ala Leu 145 150 155 160		
Val Tyr Ala Gly Val Asp Ser Lys Lys Val Phe Asp Lys Gly Val Ala 165 170 175		
Glu Arg Val Thr Met Leu Gly Lys Ile Phe Asp Gln Asn Lys Lys Ala 180 185 190		
Lys Thr Phe Asn Lys Asp Ile Ala Gln Ala Val Leu Lys Leu Gln Lys 195 200 205		
Thr Ile Glu Lys Lys Gly Lys Pro Thr Ala Leu Phe Val Met Ala Asn 210 215 220		
Ser Gly Glu Leu Leu Thr Gln Ser Pro Ser Gly Arg Phe Gly Trp Ile 225 230 235 240		
Phe Ser Val Gly Gly Phe Lys Ala Val Asn Glu Asn Glu Lys Leu Ser 245 250 255		
Ser His Gly Thr Pro Val Ser Tyr Glu Tyr Ile Ala Glu Lys Asn Pro 260 265 270		
Asn Tyr Leu Phe Val Leu Asp Arg Gly Ala Thr Ile Gly Gln Gly Ala 275 280 285		
Ser Ser Lys Glu Leu Phe Asn Asn Asp Val Ile Lys Ala Thr Asp Ala 290 295 300		
Val Lys Asn Lys Arg Val His Glu Val Asp Gly Lys Asp Trp Tyr Ile 305 310 315 320		
Asn Ser Gly Gly Ser Arg Val Thr Leu Arg Met Ile Lys Asp Val Gln 325 330 335		
Asn Phe Val Asp Asn Arg 340		

<210> 17  
 <211> 2469  
 <212> DNA  
 <213> Streptococcus agalactiae

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 tatattgatg atagcaaagg taaggtaaaa gcccttaaaa caaacaaaac gatggatcaa 180  
 atcagtgtg aagaaggcat ctctgctgaa cagatcgtag tcaaaattac tgaccaaggt 240  
 tatgttacct cacacggtga ccattatcat ttttacaatg ggaaagttcc ttatgatgcg 300

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attattagtg aagagttggt gatgacggat cctaattacc attttaaaaca atcagacggt 360
atcaatgaaa tcttagacgg ttacggtatt aaagtcaatg gcaactatta tgtttacctc 420
aagccaggta gtaagcgcaa aaacattcga accaaacaac aaattgctga gcaagtagcc 480
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gaagttgcgg cagtcaatga agcaaaaaga caaggacgct atactacaga cgatggctat 600
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aagagcaatg aaaaccaaca gccaaagtga gccagtaaag aagaaaaaga atcagatgac 2280
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caattagcac aaaaagctaa tatcgatcct aagtatctca tttccaacc agaagggtgc 2400
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aaccttaa
2469

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<210> 18

<211> 822

<212> PRT

<213> Streptococcus agalactiae

<400> 18

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Met Lys Lys Thr Tyr Gly Tyr Ile Gly Ser Val Ala Ala Ile Leu Leu
 1             5             10             15

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Ala Thr His Ile Gly Ser Tyr Gln Leu Gly Lys His His Met Gly Leu
 20             25             30

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Ala Thr Lys Asp Asn Gln Ile Ala Tyr Ile Asp Asp Ser Lys Gly Lys
 35             40             45

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Val Lys Ala Pro Lys Thr Asn Lys Thr Met Asp Gln Ile Ser Ala Glu
 50             55             60

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Glu Gly Ile Ser Ala Glu Gln Ile Val Val Lys Ile Thr Asp Gln Gly  
 65 70 75 80  
 Tyr Val Thr Ser His Gly Asp His Tyr His Phe Tyr Asn Gly Lys Val  
 85 90 95  
 Pro Tyr Asp Ala Ile Ile Ser Glu Glu Leu Leu Met Thr Asp Pro Asn  
 100 105 110  
 Tyr His Phe Lys Gln Ser Asp Val Ile Asn Glu Ile Leu Asp Gly Tyr  
 115 120 125  
 Val Ile Lys Val Asn Gly Asn Tyr Tyr Val Tyr Leu Lys Pro Gly Ser  
 130 135 140  
 Lys Arg Lys Asn Ile Arg Thr Lys Gln Gln Ile Ala Glu Gln Val Ala  
 145 150 155 160  
 Lys Gly Thr Lys Glu Ala Lys Glu Lys Gly Leu Ala Gln Val Ala His  
 165 170 175  
 Leu Ser Lys Glu Glu Val Ala Ala Val Asn Glu Ala Lys Arg Gln Gly  
 180 185 190  
 Arg Tyr Thr Thr Asp Asp Gly Tyr Ile Phe Ser Pro Thr Asp Ile Ile  
 195 200 205  
 Asp Asp Leu Gly Asp Ala Tyr Leu Val Pro His Gly Asn His Tyr His  
 210 215 220  
 Tyr Ile Pro Lys Lys Asp Leu Ser Pro Ser Glu Leu Ala Ala Ala Gln  
 225 230 235 240  
 Ala Tyr Trp Ser Gln Lys Gln Gly Arg Gly Ala Arg Pro Ser Asp Tyr  
 245 250 255  
 Arg Pro Thr Pro Ala Pro Gly Arg Arg Lys Ala Pro Ile Pro Asp Val  
 260 265 270  
 Thr Pro Asn Pro Gly Gln Gly His Gln Pro Asp Asn Gly Gly Tyr His  
 275 280 285  
 Pro Ala Pro Pro Arg Pro Asn Asp Ala Ser Gln Asn Lys His Gln Arg  
 290 295 300  
 Asp Glu Phe Lys Gly Lys Thr Phe Lys Glu Leu Leu Asp His Leu His  
 305 310 315 320  
 Arg Leu Asp Leu Lys Tyr Arg His Val Glu Glu Asp Gly Leu Ile Phe  
 325 330 335  
 Glu Pro Thr Gln Val Ile Lys Ser Asn Ala Phe Gly Tyr Val Val Pro  
 340 345 350  
 His Gly Asp His Tyr His Ile Ile Pro Arg Ser Gln Leu Ser Pro Leu  
 355 360 365

Glu Met Glu Leu Ala Asp Arg Tyr Leu Ala Gly Gln Thr Asp Asp Asn  
 370. 375 380  
 Asp Ser Gly Ser Asp His Ser Lys Pro Ser Asp Lys Glu Val Thr His  
 385 390 395 400  
 Thr Phe Leu Gly His Arg Ile Lys Ala Tyr Gly Lys Gly Leu Asp Gly  
 405 410 415  
 Lys Pro Tyr Asp Thr Ser Asp Ala Tyr Val Phe Ser Lys Glu Ser Ile  
 420 425 430  
 His Ser Val Asp Lys Ser Gly Val Thr Ala Lys His Gly Asp His Phe  
 435 440 445  
 His Tyr Ile Gly Phe Gly Glu Leu Glu Gln Tyr Glu Leu Asp Glu Val  
 450 455 460  
 Ala Asn Trp Val Lys Ala Lys Gly Gln Ala Asp Glu Leu Val Ala Ala  
 465 470 475 480  
 Leu Asp Gln Glu Gln Gly Lys Glu Lys Pro Leu Phe Asp Thr Lys Lys  
 485 490 495  
 Val Ser Arg Lys Val Thr Lys Asp Gly Lys Val Gly Tyr Ile Met Pro  
 500 505 510  
 Lys Asp Gly Lys Asp Tyr Phe Tyr Ala Arg Tyr Gln Leu Asp Leu Thr  
 515 520 525  
 Gln Ile Ala Phe Ala Glu Gln Glu Leu Met Leu Lys Asp Lys Lys His  
 530 535 540  
 Tyr Arg Tyr Asp Ile Val Asp Thr Gly Ile Glu Pro Arg Leu Ala Val  
 545 550 555 560  
 Asp Val Ser Ser Leu Pro Met His Ala Gly Asn Ala Thr Tyr Asp Thr  
 565 570 575  
 Gly Ser Ser Phe Val Ile Pro His Ile Asp His Ile His Val Val Pro  
 580 585 590  
 Tyr Ser Trp Leu Thr Arg Asn Gln Ile Ala Thr Ile Lys Tyr Val Met  
 595 600 605  
 Gln His Pro Glu Val Arg Pro Asp Val Trp Ser Lys Pro Gly His Glu  
 610 615 620  
 Glu Ser Gly Ser Val Ile Pro Asn Val Thr Pro Leu Asp Lys Arg Ala  
 625 630 635 640  
 Gly Met Pro Asn Trp Gln Ile Ile His Ser Ala Glu Glu Val Gln Lys  
 645 650 655  
 Ala Leu Ala Glu Gly Arg Phe Ala Ala Pro Asp Gly Tyr Ile Phe Asp  
 660 665 670

Pro Arg Asp Val Leu Ala Lys Glu Thr Phe Val Trp Lys Asp Gly Ser  
 675 680 685  
 Phe Ser Ile Pro Arg Ala Asp Gly Ser Ser Leu Arg Thr Ile Asn Lys  
 690 695 700  
 Ser Asp Leu Ser Gln Ala Glu Trp Gln Gln Ala Gln Glu Leu Leu Ala  
 705 710 715 720  
 Lys Lys Asn Ala Gly Asp Ala Thr Asp Thr Asp Lys Pro Glu Glu Lys  
 725 730 735  
 Gln Gln Ala Asp Lys Ser Asn Glu Asn Gln Gln Pro Ser Glu Ala Ser  
 740 745 750  
 Lys Glu Glu Lys Glu Ser Asp Asp Phe Ile Asp Ser Leu Pro Asp Tyr  
 755 760 765  
 Gly Leu Asp Arg Ala Thr Leu Glu Asp His Ile Asn Gln Leu Ala Gln  
 770 775 780  
 Lys Ala Asn Ile Asp Pro Lys Tyr Leu Ile Phe Gln Pro Glu Gly Val  
 785 790 795 800  
 Gln Phe Tyr Asn Lys Asn Gly Glu Leu Val Thr Tyr Asp Ile Lys Thr  
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 Leu Gln Gln Ile Asn Pro  
 820

<210> 19  
 <211> 939  
 <212> DNA  
 <213> Streptococcus agalactiae

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 ttaggtttta atgttattgt tttactagga attagtattt ggcaatacag tcgttacagg 180  
 aaaaaaatgt tacatctcaa atattttaat agtagtcagg acccctcttt cgaacttcaa 240  
 ccgagtgtatt acgcttattt taatattatt acacaattag aagctagaga agcgcaaaaa 300  
 gtttctgaaa caattgaaca aaccaatcat gttgcactta tgataaagat gtggtcgcac 360  
 caaatgaaag ttccattggc agctattttca ttaatggccc agacaaatca tctcgatcct 420  
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 ttgaaattta gacaatatcg tgacgatttt cgttttgaag ctgtagcct tagagaagta 540  
 gtagtagaaa ttataaaatc gtataagggt atttgtctat ccaaagctt atctatcata 600  
 attgaaggcg ataatatctg gaaaacagac aaaaagtggg taacttttgc tctttcacag 660  
 gtgctagata atgccataaa atatttcta cctgagtcaa agataataat aagcatagga 720  
 gaagagagta ttagaataca agactacggg atcggcatac tcgaagagga tatccctaga 780  
 ctttttgaag atggctttac gggttacaac ggtcatgagc accaaaaggc aacaggcatg 840  
 gggttatata tgacaaaaga agtcttatct agtctgaatt tgtccatttc ggtggatagc 900  
 aaaattaatt atgggactgc tgtttctata cataaataa 939

<210> 20

<211> 312

<212> PRT

<213> Streptococcus agalactiae

<400> 20

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Ile Met Met Phe Val Leu Phe Phe Ile Ser Phe Tyr Leu Tyr His Leu  
20 25 30  
Pro Met Pro Tyr Leu Phe Asn Ser Leu Gly Leu Asn Val Ile Val Leu  
35 40 45  
Leu Gly Ile Ser Ile Trp Gln Tyr Ser Arg Tyr Arg Lys Lys Met Leu  
50 55 60  
His Leu Lys Tyr Phe Asn Ser Ser Gln Asp Pro Ser Phe Glu Leu Gln  
65 70 75 80  
Pro Ser Asp Tyr Ala Tyr Phe Asn Ile Ile Thr Gln Leu Glu Ala Arg  
85 90 95  
Glu Ala Gln Lys Val Ser Glu Thr Ile Glu Gln Thr Asn His Val Ala  
100 105 110  
Leu Met Ile Lys Met Trp Ser His Gln Met Lys Val Pro Leu Ala Ala  
115 120 125  
Ile Ser Leu Met Ala Gln Thr Asn His Leu Asp Pro Lys Glu Val Glu  
130 135 140  
Gln Gln Leu Leu Lys Leu Gln His Tyr Leu Glu Thr Leu Leu Ala Phe  
145 150 155 160  
Leu Lys Phe Arg Gln Tyr Arg Asp Asp Phe Arg Phe Glu Ala Val Ser  
165 170 175  
Leu Arg Glu Val Val Val Glu Ile Ile Lys Ser Tyr Lys Val Ile Cys  
180 185 190  
Leu Ser Lys Ser Leu Ser Ile Ile Ile Glu Gly Asp Asn Ile Trp Lys  
195 200 205  
Thr Asp Lys Lys Trp Leu Thr Phe Ala Leu Ser Gln Val Leu Asp Asn  
210 215 220  
Ala Ile Lys Tyr Ser Asn Pro Glu Ser Lys Ile Ile Ile Ser Ile Gly  
225 230 235 240  
Glu Glu Ser Ile Arg Ile Gln Asp Tyr Gly Ile Gly Ile Leu Glu Glu  
245 250 255  
Asp Ile Pro Arg Leu Phe Glu Asp Gly Phe Thr Gly Tyr Asn Gly His  
260 265 270  
Glu His Gln Lys Ala Thr Gly Met Gly Leu Tyr Met Thr Lys Glu Val



275

280

285

Leu Ser Ser Leu Asn Leu Ser Ile Ser Val Asp Ser Lys Ile Asn Tyr  
 290 295 300

Gly Thr Ala Val Ser Ile His Lys  
 305 310

&lt;210&gt; 21

&lt;211&gt; 942

&lt;212&gt; DNA

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 21

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 accacattaa aatctctctg tgtctatcat gagaatctct caatttttat ttttaatcaa 120  
 gatattcctc aagaatgggt ttttagctatg aaagataggg ttggacaaac tggaaatcaa 180  
 attcaggatg taaagctctt ccatgatcac ttatcccca aatgggaaaa taaaaagctt 240  
 aatcatatta attatatgac ctatgctcgt tatttcatac ctcagtacat ctcagctgat 300  
 acagttttat atcttgactc tgacttagtt gttactacta atttagataa cctctttcaa 360  
 atttcactag acaatgcata tttagctgca gttccagctc tttttgggct tggatatggg 420  
 tttaatgctg gagtaatggg aattaacaac caacgttggc gacaagaaaa tatgactatt 480  
 aaattaattg aaaaaaatca aaaggaaatt gagaatgcc acaagggga tcaaacaatt 540  
 cttaatcgca tgtttgaaaa tcaggtaatt tatttagatg atacctacaa ttttcaaatt 600  
 ggttttgata tgggagctgc tatcgatggg cataaattta tttttgacat cccaattacc 660  
 ccactcccaa aaattattca ctacatttcg ggaatcaaac cttggcaaac attatcaaatt 720  
 atgagactcc gtgaggtatg gtggcactat aatttacttg aatgggtcaag tatcatatct 780  
 agtaaaaaag tatttggttt agaccacca attaaaacac aaaattatcg tctcaatttc 840  
 cttattgcta caacttctga ttgtatacca tctatctcag aattagtcac tgcccttcca 900  
 gattgtctat ttcacattgc atgcaccaac agttatgtct ga 942

&lt;210&gt; 22

&lt;211&gt; 313

&lt;212&gt; PRT

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 22

Met Thr Tyr Gln Lys Thr Val Val Leu Ala Gly Asp Tyr Ser Tyr Ile  
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Arg Gln Ile Glu Thr Thr Leu Lys Ser Leu Cys Val Tyr His Glu Asn  
 20 25 30

Leu Ser Ile Phe Ile Phe Asn Gln Asp Ile Pro Gln Glu Trp Phe Leu  
 35 40 45

Ala Met Lys Asp Arg Val Gly Gln Thr Gly Asn Gln Ile Gln Asp Val  
 50 55 60

Lys Leu Phe His Asp His Leu Ser Pro Lys Trp Glu Asn Lys Lys Leu  
 65 70 75 80

Asn His Ile Asn Tyr Met Thr Tyr Ala Arg Tyr Phe Ile Pro Gln Tyr  
 85 90 95

Ile Ser Ala Asp Thr Val Leu Tyr Leu Asp Ser Asp Leu Val Val Thr  
 100 105 110  
 Thr Asn Leu Asp Asn Leu Phe Gln Ile Ser Leu Asp Asn Ala Tyr Leu  
 115 120 125  
 Ala Ala Val Pro Ala Leu Phe Gly Leu Gly Tyr Gly Phe Asn Ala Gly  
 130 135 140  
 Val Met Val Ile Asn Asn Gln Arg Trp Arg Gln Glu Asn Met Thr Ile  
 145 150 155 160  
 Lys Leu Ile Glu Lys Asn Gln Lys Glu Ile Glu Asn Ala Asn Glu Gly  
 165 170 175  
 Asp Gln Thr Ile Leu Asn Arg Met Phe Glu Asn Gln Val Ile Tyr Leu  
 180 185 190  
 Asp Asp Thr Tyr Asn Phe Gln Ile Gly Phe Asp Met Gly Ala Ala Ile  
 195 200 205  
 Asp Gly His Lys Phe Ile Phe Asp Ile Pro Ile Thr Pro Leu Pro Lys  
 210 215 220  
 Ile Ile His Tyr Ile Ser Gly Ile Lys Pro Trp Gln Thr Leu Ser Asn  
 225 230 235 240  
 Met Arg Leu Arg Glu Val Trp Trp His Tyr Asn Leu Leu Glu Trp Ser  
 245 250 255  
 Ser Ile Ile Ser Ser Lys Lys Val Phe Gly Leu Asp His Pro Ile Lys  
 260 265 270  
 Thr Gln Asn Tyr Arg Leu Asn Phe Leu Ile Ala Thr Thr Ser Asp Cys  
 275 280 285  
 Ile Pro Ser Ile Ser Glu Leu Val Thr Ala Leu Pro Asp Cys Leu Phe  
 290 295 300  
 His Ile Ala Cys Thr Asn Ser Tyr Val  
 305 310

<210> 23

<211> 1146

<212> DNA

<213> Streptococcus agalactiae

<400> 23

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 tatattgatg atagcaaagg taaggtaaaa gccctaataa caaacaacac gatggatcaa 180  
 atcagtgtcg aagaaggcat ctctgctgaa cagatcgtag tcaaaattac tgaccaaggt 240  
 tatgttacct cacacggtga ccattatcat ttttacaatg ggaaagttcc ttatgatgcg 300  
 attattagtg aagagttggt gatgacggat cctaattacc attttaaaca atcagacggt 360

atcaatgaaa tcttagacgg ttacgttatt aaagtcaatg gcaactatta tgtttacctc 420  
 aagccaggta gtaagcgcaa aaacattcga accaaacaac aaattgctga gcaagtagcc 480  
 aaaggaacta aagaagctaa agaaaaagggt ttagctcaag tggcccatct cagtaaagaa 540  
 gaagttgctg cagtcaatga agcaaaaaga caaggacgct atactacaga cgatggctat 600  
 attttttagtc cgacagatat cattgatgat ttaggagatg cttatttagt acctcatggg 660  
 aatcactatc attatattcc taaaaaagat ttgtctccaa gtgagctagc tgctgcacaa 720  
 gcctactgga gtcaaaaaca aggtcgagggt gctagaccgt ctgattaccg cccgacacca 780  
 gccccaggtc gtaggaaagc cccacttctt gatgtgacgc ctaaccctgg acaagggtcat 840  
 cagccagata acggtgggta tcatccagcg cctcctaggc caaatgatgc gtcacaaaac 900  
 aaacacacaaa gagatgagtt taaaggaaaa acctttaagg aactttttaga tcaactacac 960  
 cgtcttgatt tgaaataaccg tcatgtggaa gaagatgggt tgatttttga accgactcaa 1020  
 gtgatcaaat caaacgcttt tgggtatgtg gtgcctcatg gagatcatta tcatattatc 1080  
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 aactga 1146

<210> 24

<211> 381

<212> PRT

<213> Streptococcus agalactiae

<400> 24

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Ala Thr His Ile Gly Ser Tyr Gln Leu Gly Lys His His Met Gly Leu  
 20 25 30

Ala Thr Lys Asp Asn Gln Ile Ala Tyr Ile Asp Asp Ser Lys Gly Lys  
 35 40 45

Val Lys Ala Pro Lys Thr Asn Lys Thr Met Asp Gln Ile Ser Ala Glu  
 50 55 60

Glu Gly Ile Ser Ala Glu Gln Ile Val Val Lys Ile Thr Asp Gln Gly  
 65 70 75 80

Tyr Val Thr Ser His Gly Asp His Tyr His Phe Tyr Asn Gly Lys Val  
 85 90 95

Pro Tyr Asp Ala Ile Ile Ser Glu Glu Leu Leu Met Thr Asp Pro Asn  
 100 105 110

Tyr His Phe Lys Gln Ser Asp Val Ile Asn Glu Ile Leu Asp Gly Tyr  
 115 120 125

Val Ile Lys Val Asn Gly Asn Tyr Tyr Val Tyr Leu Lys Pro Gly Ser  
 130 135 140

Lys Arg Lys Asn Ile Arg Thr Lys Gln Gln Ile Ala Glu Gln Val Ala  
 145 150 155 160

Lys Gly Thr Lys Glu Ala Lys Glu Lys Gly Leu Ala Gln Val Ala His  
 165 170 175

Leu Ser Lys Glu Glu Val Ala Ala Val Asn Glu Ala Lys Arg Gln Gly  
 180 185 190

Arg Tyr Thr Thr Asp Asp Gly Tyr Ile Phe Ser Pro Thr Asp Ile Ile  
 195 200 205  
 Asp Asp Leu Gly Asp Ala Tyr Leu Val Pro His Gly Asn His Tyr His  
 210 215 220  
 Tyr Ile Pro Lys Lys Asp Leu Ser Pro Ser Glu Leu Ala Ala Ala Gln  
 225 230 235 240  
 Ala Tyr Trp Ser Gln Lys Gln Gly Arg Gly Ala Arg Pro Ser Asp Tyr  
 245 250 255  
 Arg Pro Thr Pro Ala Pro Gly Arg Arg Lys Ala Pro Leu Pro Asp Val  
 260 265 270  
 Thr Pro Asn Pro Gly Gln Gly His Gln Pro Asp Asn Gly Gly Tyr His  
 275 280 285  
 Pro Ala Pro Pro Arg Pro Asn Asp Ala Ser Gln Asn Lys His Gln Arg  
 290 295 300  
 Asp Glu Phe Lys Gly Lys Thr Phe Lys Glu Leu Leu Asp Gln Leu His  
 305 310 315 320  
 Arg Leu Asp Leu Lys Tyr Arg His Val Glu Glu Asp Gly Leu Ile Phe  
 325 330 335  
 Glu Pro Thr Gln Val Ile Lys Ser Asn Ala Phe Gly Tyr Val Val Pro  
 340 345 350  
 His Gly Asp His Tyr His Ile Ile Pro Arg Ser Gln Leu Ser Pro Leu  
 355 360 365  
 Glu Met Glu Leu Ala Asp Arg Tyr Leu Thr Arg Pro Asn  
 370 375 380

<210> 25

<211> 660

<212> DNA

<213> Streptococcus agalactiae

<400> 25

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 ggtcaacaaa tagatggagt gaaattcaca cagatatatg aggactatat gaaattactc 180  
 agtcaaggta aggatatcgc agagttatat caaaaatatt ctaaagaaga gttggcaaat 240  
 ctaggcatta atatttatca atccaatgat atagaaagga ctgaggaaag aacttttgat 300  
 gaaattatca gttgggtttc caacccttat gcaacaagac caattcaaga aaggcacact 360  
 attcaattag agccaacaag attttcacta gaggataaga aaagaattga agaagctgca 420  
 gctcaaggac taagcgaaat cgaccttatt gatttagttg acctatatga tattaattta 480  
 gacaatacaa gcgtcaatcg ccatattgtg gggttattga ctaataacac ccaagtaaca 540  
 tactatttcc aagaacaatt aaataaggag ttgctgtcaa tggctcacgc tttagataac 600  
 gtacaacagg cctttattaa attattaagt gaagaggaga tacgaaaatt tgctctttaa 660

<210> 26  
 <211> 219  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 26  
 Met Val Asn Asp Ile Leu Glu Arg Met Tyr Lys Glu Asn Ile Pro Lys  
           1                  5                  10                  15  
 Ser Tyr Leu Thr Ser Val Pro Leu Val Ile Ser Gln Lys Gly Arg Thr  
                   20                  25                  30  
 Thr Tyr Ser Phe Ser Met Thr Gly Gly Gln Gln Ile Asp Gly Val Lys  
                   35                  40                  45  
 Phe Thr Gln Ile Tyr Glu Asp Tyr Met Lys Leu Leu Ser Gln Gly Lys  
           50                  55                  60  
 Asp Ile Ala Glu Leu Tyr Gln Lys Tyr Ser Lys Glu Glu Leu Ala Asn  
           65                  70                  75                  80  
 Leu Gly Ile Asn Ile Tyr Gln Ser Asn Asp Ile Glu Arg Thr Glu Glu  
                   85                  90                  95  
 Arg Thr Phe Asp Glu Ile Ile Ser Trp Val Ser Asn Pro Tyr Ala Thr  
                   100                  105                  110  
 Arg Pro Ile Gln Glu Arg His Thr Ile Gln Leu Glu Pro Thr Arg Phe  
                   115                  120                  125  
 Ser Leu Glu Asp Lys Lys Arg Ile Glu Glu Ala Ala Ala Gln Gly Leu  
           130                  135                  140  
 Ser Glu Ile Asp Leu Ile Asp Leu Val Asp Leu Tyr Asp Ile Asn Leu  
           145                  150                  155                  160  
 Asp Asn Thr Ser Val Asn Arg His Ile Val Gly Leu Leu Thr Asn Asn  
                   165                  170                  175  
 Thr Gln Val Thr Tyr Tyr Phe Gln Glu Gln Leu Asn Lys Glu Leu Leu  
                   180                  185                  190  
 Ser Met Ala His Ala Leu Asp Asn Val Gln Gln Ala Phe Ile Lys Leu  
                   195                  200                  205  
 Leu Ser Glu Glu Glu Ile Arg Lys Phe Ala Leu  
           210                  215

<210> 27  
 <211> 653  
 <212> DNA  
 <213> Streptococcus agalactiae

<400> 27

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atgaataaaa gaagaaaatt atcaaaattg aatgtaaaaa aacaacattt agcttatgga 60
gctatcactt tagtagccct tttttcatgt attttggtg taacgggtcat ctttaaaagt 120
tcacaagtta ctactgaatc tttgtcaaaa gcagataaag ttcgcgtagc caaaaaatca 180
aaaatgacta aggcgacatc taaatcaaaa gtagaagatg taaaacaggc tccaaaacct 240
tctcaggcat ctaatgaagc cccaaaatca agttctcaat ctacagaagc taattctcag 300
caacaagtta ctgcgagtga agaggcggct gtagaacaag cagttgtaac agaaaatacc 360
cctgctacca gtcaggcaca acaaacttat gctgttactg agacaactta caaacctgct 420
caacaccaga caagtggcca agtattgagc aatggaaata ctgcaggggc ggtcggatct 480
gctgctgcag cacaaatggc tgctgcaaca ggagtccttc agtctacttg ggaacatatt 540
attgcccggtg aatcaaattg taatcctaag gttgctaag cctcaggggc ttcaggactt 600
ttccaaacga tgccagggtg gggttcaaca gctacagttc aggatcaagt taa 653

```

<210> 28

<211> 234

<212> PRT

<213> Streptococcus agalactiae

<400> 28

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Met Asn Lys Arg Arg Lys Leu Ser Lys Leu Asn Val Lys Lys Gln His
  1             5             10             15

```

```

Leu Ala Tyr Gly Ala Ile Thr Leu Val Ala Leu Phe Ser Cys Ile Leu
          20             25             30

```

```

Ala Val Thr Val Ile Phe Lys Ser Ser Gln Val Thr Thr Glu Ser Leu
      35             40             45

```

```

Ser Lys Ala Asp Lys Val Arg Val Ala Lys Lys Ser Lys Met Thr Lys
      50             55             60

```

```

Ala Thr Ser Lys Ser Lys Val Glu Asp Val Lys Gln Ala Pro Lys Pro
      65             70             75             80

```

```

Ser Gln Ala Ser Asn Glu Ala Pro Lys Ser Ser Ser Gln Ser Thr Glu
          85             90             95

```

```

Ala Asn Ser Gln Gln Gln Val Thr Ala Ser Glu Glu Ala Ala Val Glu
      100             105             110

```

```

Gln Ala Val Val Thr Glu Asn Thr Pro Ala Thr Ser Gln Ala Gln Gln
      115             120             125

```

```

Thr Tyr Ala Val Thr Glu Thr Thr Tyr Lys Pro Ala Gln His Gln Thr
      130             135             140

```

```

Ser Gly Gln Val Leu Ser Asn Gly Asn Thr Ala Gly Ala Val Gly Ser
      145             150             155             160

```

```

Ala Ala Ala Ala Gln Met Ala Ala Ala Thr Gly Val Pro Gln Ser Thr
          165             170             175

```

```

Trp Glu His Ile Ile Ala Arg Glu Ser Asn Gly Asn Pro Asn Val Ala
          180             185             190

```

```

Asn Ala Ser Gly Ala Ser Gly Leu Phe Gln Thr Met Pro Gly Trp Gly
      195             200             205

```

Ser Thr Ala Thr Val Gln Asp Gln Val Asn Ser Ala Ile Lys Ala Tyr  
 210 215 220

Arg Ala Gln Gly Leu Ser Ala Trp Gly Tyr  
 225 230

<210> 29  
 <211> 360  
 <212> DNA  
 <213> Streptococcus agalactiae

<400> 29  
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 cgtaatcaac gttttgcaga acgcgttttg accgaacaag aattgcttct ttttaaagga 120  
 atttccaatc ccaagcgtca gatgtctttt ttaacagggc gatgggcagc aaaagaggct 180  
 tatagcaaag cacttggaac aggaattggg aaagttaatt ttcattgatat cgaaatttta 240  
 tcggatgata aaggagcgcc ttgattaca aaagaaccgt ttaattggaaa atcttttggt 300  
 tcaatatctc atagtggtaa ttatgcacaa gctagtgtta ttttggagga agaaaaatga 360

<210> 30  
 <211> 119  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 30  
 Met Ile Val Gly His Gly Ile Asp Leu Gln Glu Ile Glu Ala Ile Thr  
 1 5 10 15  
 Lys Ala Tyr Glu Arg Asn Gln Arg Phe Ala Glu Arg Val Leu Thr Glu  
 20 25 30  
 Gln Glu Leu Leu Leu Phe Lys Gly Ile Ser Asn Pro Lys Arg Gln Met  
 35 40 45  
 Ser Phe Leu Thr Gly Arg Trp Ala Ala Lys Glu Ala Tyr Ser Lys Ala  
 50 55 60  
 Leu Gly Thr Gly Ile Gly Lys Val Asn Phe His Asp Ile Glu Ile Leu  
 65 70 75 80  
 Ser Asp Asp Lys Gly Ala Pro Leu Ile Thr Lys Glu Pro Phe Asn Gly  
 85 90 95  
 Lys Ser Phe Val Ser Ile Ser His Ser Gly Asn Tyr Ala Gln Ala Ser  
 100 105 110  
 Val Ile Leu Glu Glu Glu Lys  
 115

<210> 31  
 <211> 474

<212> DNA

<213> Streptococcus agalactiae

<400> 31

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atgatttttg tcacagtggg gacacatgaa cagcagttca accgtcttat taaagaagtt 60
gatagattaa aaggacagg tgctattgat caagaagtgt tcattcaaac gggttactca 120
gacttcgaac ctcagaattg tcagtgggtca aaatttctct catatgatga tatgaactct 180
tacatgaaag aagctgagat tgttatcaca catggcggcc cagcgacgtt tatgtcagtt 240
atttcttttag ggaaattacc agttgttgtt cctaggagaa agcagtttgg tgaacatata 300
aatgatcatc aaatacaatt tttaaaaaaa attgccacc tgtatccctt ggcttggatt 360
gaagatgtag atggacttgc ggaagcgttg aaaaggaata tagctacaga aaaatatcag 420
ggaaataatg atatgttttg tcataaatta gaaaaaatta taggtgaaat atga 474
```

<210> 32

<211> 157

<212> PRT

<213> Streptococcus agalactiae

<400> 32

```
Met Ile Phe Val Thr Val Gly Thr His Glu Gln Gln Phe Asn Arg Leu
  1           5           10           15
```

```
Ile Lys Glu Val Asp Arg Leu Lys Gly Thr Gly Ala Ile Asp Gln Glu
      20           25           30
```

```
Val Phe Ile Gln Thr Gly Tyr Ser Asp Phe Glu Pro Gln Asn Cys Gln
      35           40           45
```

```
Trp Ser Lys Phe Leu Ser Tyr Asp Asp Met Asn Ser Tyr Met Lys Glu
      50           55           60
```

```
Ala Glu Ile Val Ile Thr His Gly Gly Pro Ala Thr Phe Met Ser Val
      65           70           75           80
```

```
Ile Ser Leu Gly Lys Leu Pro Val Val Val Pro Arg Arg Lys Gln Phe
      85           90           95
```

```
Gly Glu His Ile Asn Asp His Gln Ile Gln Phe Leu Lys Lys Ile Ala
      100          105          110
```

```
His Leu Tyr Pro Leu Ala Trp Ile Glu Asp Val Asp Gly Leu Ala Glu
      115          120          125
```

```
Ala Leu Lys Arg Asn Ile Ala Thr Glu Lys Tyr Gln Gly Asn Asn Asp
      130          135          140
```

```
Met Phe Cys His Lys Leu Glu Lys Ile Ile Gly Glu Ile
      145          150          155
```

<210> 33

<211> 1203

<212> DNA

<213> Streptococcus agalactiae



<400> 33

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ttggaagaca aattattcaa caaacatttt ataggcatta ctattttaaa ctttattggt 60
tatatgggtct attatttggt caccgttatc atagctttta ttgcgactaa agagttaggt 120
gtagcacta gccaaagcagg attagcaacg gggatttata ttgtaggac tttgattgct 180
cgtcttatat ttggttaagca attagaagtt ctaggacgta agttagtttt acgtggaggg 240
gctatttttt acttactaac aacttttagct tatttttata tgccaagtat cggagtaatg 300
tatttagttc gtttcctaaa tggttttggt tatggcgctg tgtcaacagc aactaatact 360
attgtaacag cctatatacc agctgataaa agagggtgagg ggattaactt ttacgggtcta 420
tcaacaagtt tagccgcagc tattgggtcct tttgtaggaa catttatgct agacaacctt 480
catattaact ttaaaatggt tattgtatta tgtagtattt taattgcat tgtagtggtg 540
ggagcatttg ttttcccagt caaaaatatt actttaaatc cagaacagtt agctaaatca 600
aaatcatgga ctattgatag tttcattgag aaaaaagcaa tttttatcac aattattgca 660
tttttgatgg gtatctccta tgcttccgtg ttaggtttcc aaaaattata tacaacagaa 720
attaatttga tgacagtagg agcttatttc tttattggtt atgcacttgt catcacttta 780
accagaccat ctatgggaag attaatggac gctaaggagg ataagtgggt gctttatcca 840
agttatctgt tcttaacttt gggacttgct ttattaggga gtgctatggg aagtgttacc 900
taccttctat caggtgcttt gattgggttt ggttatggca cctttatgtc ttgtggccaa 960
gcagcatcaa tcaaagggtg tgaggaacat cgtttcaata cagccatgtc aacttacatg 1020
ataggtcttg atttagggtt aggtgctgga ccttacattt tgggacttgt taaagatggt 1080
tttcttgagg ctggtgtgca atcctttaga gaattattct ggatagcagc gattattcct 1140
gttggttggt gtattctata tttcttaaaa tcatctagac aagttgaaac taaaactata 1200
taa

```

<210> 34

<211> 400

<212> PRT

<213> Streptococcus agalactiae

<400> 34

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Met Glu Asp Lys Leu Phe Asn Lys His Phe Ile Gly Ile Thr Ile Leu
  1              5              10              15

Asn Phe Ile Val Tyr Met Val Tyr Tyr Leu Phe Thr Val Ile Ile Ala
      20              25              30

Phe Ile Ala Thr Lys Glu Leu Gly Val Ser Thr Ser Gln Ala Gly Leu
      35              40              45

Ala Thr Gly Ile Tyr Ile Val Gly Thr Leu Ile Ala Arg Leu Ile Phe
      50              55              60

Gly Lys Gln Leu Glu Val Leu Gly Arg Lys Leu Val Leu Arg Gly Gly
      65              70              75              80

Ala Ile Phe Tyr Leu Leu Thr Thr Leu Ala Tyr Phe Tyr Met Pro Ser
      85              90              95

Ile Gly Val Met Tyr Leu Val Arg Phe Leu Asn Gly Phe Gly Tyr Gly
      100             105             110

Val Val Ser Thr Ala Thr Asn Thr Ile Val Thr Ala Tyr Ile Pro Ala
      115             120             125

Asp Lys Arg Gly Glu Gly Ile Asn Phe Tyr Gly Leu Ser Thr Ser Leu
      130             135             140

```

Ala Ala Ala Ile Gly Pro Phe Val Gly Thr Phe Met Leu Asp Asn Leu  
 145 150 155 160  
 His Ile Asn Phe Lys Met Val Ile Val Leu Cys Ser Ile Leu Ile Ala  
 165 170 175  
 Ile Val Val Leu Gly Ala Phe Val Phe Pro Val Lys Asn Ile Thr Leu  
 180 185 190  
 Asn Pro Glu Gln Leu Ala Lys Ser Lys Ser Trp Thr Ile Asp Ser Phe  
 195 200 205  
 Ile Glu Lys Lys Ala Ile Phe Ile Thr Ile Ile Ala Phe Leu Met Gly  
 210 215 220  
 Ile Ser Tyr Ala Ser Val Leu Gly Phe Gln Lys Leu Tyr Thr Thr Glu  
 225 230 235 240  
 Ile Asn Leu Met Thr Val Gly Ala Tyr Phe Phe Ile Val Tyr Ala Leu  
 245 250 255  
 Val Ile Thr Leu Thr Arg Pro Ser Met Gly Arg Leu Met Asp Ala Lys  
 260 265 270  
 Gly Asp Lys Trp Val Leu Tyr Pro Ser Tyr Leu Phe Leu Thr Leu Gly  
 275 280 285  
 Leu Ala Leu Leu Gly Ser Ala Met Gly Ser Val Thr Tyr Leu Leu Ser  
 290 295 300  
 Gly Ala Leu Ile Gly Phe Gly Tyr Gly Thr Phe Met Ser Cys Gly Gln  
 305 310 315 320  
 Ala Ala Ser Ile Lys Gly Val Glu Glu His Arg Phe Asn Thr Ala Met  
 325 330 335  
 Ser Thr Tyr Met Ile Gly Leu Asp Leu Gly Leu Gly Ala Gly Pro Tyr  
 340 345 350  
 Ile Leu Gly Leu Val Lys Asp Gly Phe Leu Gly Ala Gly Val Gln Ser  
 355 360 365  
 Phe Arg Glu Leu Phe Trp Ile Ala Ala Ile Ile Pro Val Val Cys Gly  
 370 375 380  
 Ile Leu Tyr Phe Leu Lys Ser Ser Arg Gln Val Glu Thr Lys Thr Ile  
 385 390 395 400

<210> 35

<211> 393

<212> DNA

<213> Streptococcus agalactiae

<400> 35  
atgaatagtg aacctaaaaag tcagtcaaac gaagtaaaaa atagcaagca atcagaagtg 60  
aagaaagata aaaaaatgac aaaaaaagaa caattagcct atctcaaaga gcatgagcaa 120  
gaaatcatag attatgtaaa attacataac aaccaaattg agtccgttca attcgattgg 180  
tcaagtgtaa aagtagaaca aagcggggaat ggaactccac aaggggggtga ttataatctt 240  
tcactgagag gaaagttaa tcatctacaa aattcaaaat taatagttga tttttattta 300  
gctcataaaa atgatatccc aaatatcaaa tcaatgggaa tgctaaataa gccatatata 360  
cataaaaaatg gtatttggca catttatgaa tag 393

<210> 36  
<211> 137  
<212> PRT  
<213> Streptococcus agalactiae

<400> 36  
Met Ile Leu Gly Gly Cys Gln Met Asn Ser Glu Pro Lys Ser Gln Ser  
1 5 10 15  
Asn Glu Val Lys Asn Ser Lys Gln Ser Glu Val Lys Lys Asp Lys Lys  
20 25 30  
Met Thr Lys Lys Glu Gln Leu Ala Tyr Leu Lys Glu His Glu Gln Glu  
35 40 45  
Ile Ile Asp Tyr Val Lys Leu His Asn Asn Gln Ile Glu Ser Val Gln  
50 55 60  
Phe Asp Trp Ser Ser Val Lys Val Glu Gln Ser Gly Asn Gly Thr Pro  
65 70 75 80  
Gln Gly Gly Asp Tyr Asn Leu Ser Leu Arg Gly Lys Phe Asn His Leu  
85 90 95  
Gln Asn Ser Lys Leu Ile Val Asp Phe Tyr Leu Ala His Lys Asn Asp  
100 105 110  
Ile Pro Asn Ile Lys Ser Met Gly Met Leu Asn Lys Pro Tyr Ile His  
115 120 125  
Lys Asn Gly Ile Trp His Ile Tyr Glu  
130 135

<210> 37  
<211> 927  
<212> DNA  
<213> Streptococcus agalactiae

<400> 37  
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agtgtagcag ctagttttta tttttccac gttgccaag ttcgagatga taaatccttt 120  
atttcaaagtg gtcaacgtaa gcctggaaac tttttatatg cttatgataa atcctttgat 180  
aagctattaa agcaaaaaat agaaatgaca aaccaaata taaagcaagt tgcttggtat 240  
gttctgtgct ctaagaaaac tcataagaca gttgttgtcg ttcatggttt tgccaatagc 300

aaagagaata tgaaggcata tgggtggctg tttcataagt taggatacaa tgttcttatg 360  
 cctgacaaca ttgcacatgg tgaaagtcac gggcagttga taggctatgg ctggaacgac 420  
 cgcgagaaca ttatcaaagt gacagaaatg atagtggata agaattccatc aagccaaatt 480  
 actttatttg gtgtttcaat ggggtggagca acagtcatga tggctagtgg tgaaaaatta 540  
 cctagtcagg ttgttaatat cattgaagat tgtggttatt ctagtgttg ggatgaatta 600  
 aaatttcagg ctaaagagat gtatggttta ccagccttcc cactcttata tgaagtttca 660  
 acaattttcta aaatcagagc aggtttttcg tatggacaag caagtagtgt cgaacaattg 720  
 aaaaagaata atttaccagc cctctttatt catggtgata aggataattt tgttccaaca 780  
 agtatggttt atgacaacta taaagctaca gcaggtaga aagagcttta tattgtaaaa 840  
 ggggcaaac atgcgaaatc ttttgaaaca gagccagaaa aatatgagaa acgtatctct 900  
 agttttttga aaaaatatga aaaataa 927

<210> 38

<211> 308

<212> PRT

<213> Streptococcus agalactiae

<400> 38

Met Lys Lys Ile Arg Leu Ser Lys Phe Ile Lys Met Ile Val Val Ile  
 1 5 10 15

Leu Phe Leu Ile Ser Val Ala Ala Ser Phe Tyr Phe Phe His Val Ala  
 20 25 30

Gln Val Arg Asp Asp Lys Ser Phe Ile Ser Asn Gly Gln Arg Lys Pro  
 35 40 45

Gly Asn Ser Leu Tyr Ala Tyr Asp Lys Ser Phe Asp Lys Leu Leu Lys  
 50 55 60

Gln Lys Ile Glu Met Thr Asn Gln Asn Ile Lys Gln Val Ala Trp Tyr  
 65 70 75 80

Val Pro Ala Ala Lys Lys Thr His Lys Thr Val Val Val Val His Gly  
 85 90 95

Phe Ala Asn Ser Lys Glu Asn Met Lys Ala Tyr Gly Trp Leu Phe His  
 100 105 110

Lys Leu Gly Tyr Asn Val Leu Met Pro Asp Asn Ile Ala His Gly Glu  
 115 120 125

Ser His Gly Gln Leu Ile Gly Tyr Gly Trp Asn Asp Arg Glu Asn Ile  
 130 135 140

Ile Lys Trp Thr Glu Met Ile Val Asp Lys Asn Pro Ser Ser Gln Ile  
 145 150 155 160

Thr Leu Phe Gly Val Ser Met Gly Gly Ala Thr Val Met Met Ala Ser  
 165 170 175

Gly Glu Lys Leu Pro Ser Gln Val Val Asn Ile Ile Glu Asp Cys Gly  
 180 185 190

Tyr Ser Ser Val Trp Asp Glu Leu Lys Phe Gln Ala Lys Glu Met Tyr  
 195 200 205

Gly Leu Pro Ala Phe Pro Leu Leu Tyr Glu Val Ser Thr Ile Ser Lys  
 210 215 220

Ile Arg Ala Gly Phe Ser Tyr Gly Gln Ala Ser Ser Val Glu Gln Leu  
 225 230 235 240

Lys Lys Asn Asn Leu Pro Ala Leu Phe Ile His Gly Asp Lys Asp Asn  
 245 250 255

Phe Val Pro Thr Ser Met Val Tyr Asp Asn Tyr Lys Ala Thr Ala Gly  
 260 265 270

Lys Lys Glu Leu Tyr Ile Val Lys Gly Ala Lys His Ala Lys Ser Phe  
 275 280 285

Glu Thr Glu Pro Glu Lys Tyr Glu Lys Arg Ile Ser Ser Phe Leu Lys  
 290 295 300

Lys Tyr Glu Lys  
 305

<210> 39  
 <211> 546  
 <212> DNA  
 <213> Streptococcus agalactiae

<400> 39  
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 atatctgaac aacttgattc aattcgccaa cagacattaa aaccagatta tgtattattg 120  
 agggatgatt gttcaacgga tgaaacagtc aatgtcgtca ataactatat cgaaaaacat 180  
 gagttagaag gctggaaaaat tgttaaaaaac gacaaaaact taggctggcg tttaaatttt 240  
 cgtcaattac ttattgatgt gttagcctat gaggttgact atgtcttttt tagtgatcaa 300  
 gatgatattt ggtatcttga taaaaacgaa cgacagtttg ccattatgct agataaccct 360  
 caaattgagg ttttgagtgc agacgttgat atcaaaaacga tgtctacaga agccagtgtt 420  
 ccacattttc taactttttc ttctagtgat agaatacagtc agtatcctaa agtatatgat 480  
 tatcaaakat tccgtcccgg atggaccatt gctatgaaga gagattttgc gcaagctatc 540  
 gcttga 546

<210> 40  
 <211> 181  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 40  
 Met Arg Ser Asn Met Val Lys Thr Ala Val Leu Met Ala Thr Tyr Asn  
 1 5 10 15

Gly Glu Lys Phe Ile Ser Glu Gln Leu Asp Ser Ile Arg Gln Gln Thr  
 20 25 30

Leu Lys Pro Asp Tyr Val Leu Leu Arg Asp Asp Cys Ser Thr Asp Glu  
 35 40 45

Thr Val Asn Val Val Asn Asn Tyr Ile Ala Lys His Glu Leu Glu Gly  
 50 55 60  
 Trp Lys Ile Val Lys Asn Asp Lys Asn Leu Gly Trp Arg Leu Asn Phe  
 65 70 75 80  
 Arg Gln Leu Leu Ile Asp Val Leu Ala Tyr Glu Val Asp Tyr Val Phe  
 85 90 95  
 Phe Ser Asp Gln Asp Asp Ile Trp Tyr Leu Asp Lys Asn Glu Arg Gln  
 100 105 110  
 Phe Ala Ile Met Ser Asp Asn Pro Gln Ile Glu Val Leu Ser Ala Asp  
 115 120 125  
 Val Asp Ile Lys Thr Met Ser Thr Glu Ala Ser Val Pro His Phe Leu  
 130 135 140  
 Thr Phe Ser Ser Ser Asp Arg Ile Ser Gln Tyr Pro Lys Val Tyr Asp  
 145 150 155 160  
 Tyr Gln Thr Phe Arg Pro Gly Trp Thr Ile Ala Met Lys Arg Asp Phe  
 165 170 175  
 Ala Gln Ala Ile Ala  
 180

<210> 41  
 <211> 579  
 <212> DNA  
 <213> Streptococcus agalactiae

<400> 41  
 atgattcatg agattcacga ttgtcaattt attgaaaaag gaagttacgt ttatttgaat 60  
 tatattaatg ctgagggcga gagagtagtt attataatca tagattttgt ccgtagtggt 120  
 agtcctattt tatatcgtct atttatgatt ttacttgcac aagaagtacc tcacttgcac 180  
 gattacatct ataatgcaag agatgatcac tacgatactt ggaagtttaa agaattaaag 240  
 gagtcaaacc atccagtcct tttggcattc tctgaaagggt ggcacgatag tgcgttgact 300  
 tctaaaagcc ttgcagaatg ttacaatta accgaccttg atgaagaagt gaaatcgacc 360  
 atcattcaat taagacagtt cgaaaaatca gtcagaaatc ctttggctca cctgattaaa 420  
 ccttttgatg agcaagaact atatcgta caactcaattt cttctcaagc attttttagac 480  
 cagattatct tcttggcaaa ggtaattggt gttgagtatg atactgttaa ttttcactac 540  
 gatacggtta acaagcttat tataaagata cttgagtaa 579

<210> 42  
 <211> 192  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 42  
 Met Ile His Glu Ile His Asp Cys Gln Phe Ile Glu Lys Gly Ser Tyr  
 1 5 10 15  
 Val Tyr Leu Asn Tyr Ile Asn Ala Glu Gly Glu Arg Val Val Ile Ile

20

25

30

Ile Ile Asp Phe Val Arg Ser Val Ser Pro Ile Leu Tyr Arg Leu Phe  
35 40 45

Met Ile Leu Leu Ala Gln Glu Val Pro His Leu His Asp Tyr Ile Tyr  
50 55 60

Asn Ala Arg Asp Asp His Tyr Asp Thr Trp Lys Phe Lys Glu Leu Lys  
65 70 75 80

Glu Ser Asn His Pro Val Leu Leu Ala Phe Ser Glu Arg Trp His Asp  
85 90 95

Ser Arg Leu Thr Ser Lys Ser Leu Ala Glu Cys Leu Gln Leu Thr Asp  
100 105 110

Leu Asp Glu Glu Val Lys Ser Thr Ile Ile Gln Leu Arg Gln Phe Glu  
115 120 125

Lys Ser Val Arg Asn Pro Leu Ala His Leu Ile Lys Pro Phe Asp Glu  
130 135 140

Gln Glu Leu Tyr Arg Thr Thr Gln Phe Ser Ser Gln Ala Phe Leu Asp  
145 150 155 160

Gln Ile Ile Phe Leu Ala Lys Val Ile Gly Val Glu Tyr Asp Thr Val  
165 170 175

Asn Phe His Tyr Asp Thr Val Asn Lys Leu Ile Ile Lys Ile Leu Glu  
180 185 190

&lt;210&gt; 43

&lt;211&gt; 465

&lt;212&gt; DNA

&lt;213&gt; Streptococcus agalactiae

&lt;400&gt; 43

atggtaaaag tttcaaattt agggatatcca cgtcttggtg aacagcgcga atggaagcaa 60  
gcatcggaag ctttctgggc agggaaatctt gaacaaaaag atttagaaaa acaactaaaa 120  
caattacgta tcaatcattt aaagaaacaa aaagaggcag gtattgacct tattccagtg 180  
ggggattttt cttgttatga tcatgttttg gatttgtcat ttcaattcaa tgtaatccca 240  
aagcgtttcg atgagtatga gaggaattta gacctttatt ttgctattgc aagaggtgac 300  
aaagataatg tcgcatcatc tatgaaaaag tggtttaata ccaactacca ctacatagtc 360  
ccagaatggg aggttgagac taaacctcac ttgcagaata attacttact tgatctttat 420  
ctagaagcta ggaagtagt tgggtgataaa gcaaagccgg ttatc 465

&lt;210&gt; 44

&lt;211&gt; 159

&lt;212&gt; PRT

&lt;213&gt; Streptococcus agalactiae

<400> 44

Met Glu Glu Ile Met Val Lys Val Ser Asn Leu Gly Tyr Pro Arg Leu  
1 5 10 15

Gly Glu Gln Arg Glu Trp Lys Gln Ala Ile Glu Ala Phe Trp Ala Gly  
20 25 30

Asn Leu Glu Gln Lys Asp Leu Glu Lys Gln Leu Lys Gln Leu Arg Ile  
35 40 45

Asn His Leu Lys Lys Gln Lys Glu Ala Gly Ile Asp Leu Ile Pro Val  
50 55 60

Gly Asp Phe Ser Cys Tyr Asp His Val Leu Asp Leu Ser Phe Gln Phe  
65 70 75 80

Asn Val Ile Pro Lys Arg Phe Asp Glu Tyr Glu Arg Asn Leu Asp Leu  
85 90 95

Tyr Phe Ala Ile Ala Arg Gly Asp Lys Asp Asn Val Ala Ser Ser Met  
100 105 110

Lys Lys Trp Phe Asn Thr Asn Tyr His Tyr Ile Val Pro Glu Trp Glu  
115 120 125

Val Glu Thr Lys Pro His Leu Gln Asn Asn Tyr Leu Leu Asp Leu Tyr  
130 135 140

Leu Glu Ala Arg Glu Val Val Gly Asp Lys Ala Lys Pro Val Ile  
145 150 155

<210> 45

<211> 124

<212> DNA

<213> Streptococcus agalactiae

<400> 45

atggtgttac ttttattgct aatggtagcc aagtcaagtt tgatgggttac atggctgttt 60  
ataacgatac tgacaaaaat aaaatgttac cagatatgga ggaaggagaa agttatcaag 120  
ttaa 124

<210> 46

<211> 41

<212> PRT

<213> Streptococcus agalactiae

<400> 46

Met Val Leu Leu Leu Leu Met Val Ala Lys Ser Ser Leu Met Val  
1 5 10 15

Thr Trp Leu Phe Ile Thr Ile Leu Thr Lys Ile Lys Cys Tyr Gln Ile  
20 25 30



Trp Arg Lys Glu Lys Val Ile Lys Leu  
 35 40

<210> 47  
 <211> 669  
 <212> DNA  
 <213> Streptococcus agalactiae

<400> 47  
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 tgtggacatc gtggtgcttc taaatctggt ggtaaatacag atagcttgaa gggtgcaatg 120  
 gtaacagata cgggtggtgt tgatgataaa tcatttaacc aatctgggtg ggaagggtatg 180  
 caagcttggg gcaagaagaa tggccttaaa aaaggagctg gttttgacta tttccaatcg 240  
 gcaagtgaat ctgattatgc aactaactta gatacagctg tgtctagtgg ttataaattg 300  
 attttcggta ttggattttc tcttcatgat gctattgata aagcagcaga caataacaaa 360  
 gatgttaatt acgtcatcgt tgatgatgtt attaaaggga aagataatgt tgcaagtgtt 420  
 gtctttgcgg ataataatc agcttactta gcagggtattg cagccgctaa aactacacaa 480  
 acaaaaacag ttggctttgt aggtggtatg gaatctgagg ttattaccog ttttgaaaaa 540  
 ggttttgaag caggtgtcaa atcagttgat aaatcaatta aaattaaagt tgactatgct 600  
 gggttcattcg gtgatgctgc taagggtgaag acaattgcag ccgcacaata tgcttctggc 660  
 gcagatatt 669

<210> 48  
 <211> 223  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 48  
 Met Asn Lys Lys Ile Ser Gly Ile Gly Leu Ala Ser Ile Ala Val Leu  
 1 5 10 15  
 Ser Leu Ala Ala Cys Gly His Arg Gly Ala Ser Lys Ser Gly Gly Lys  
 20 25 30  
 Ser Asp Ser Leu Lys Val Ala Met Val Thr Asp Thr Gly Gly Val Asp  
 35 40 45  
 Asp Lys Ser Phe Asn Gln Ser Gly Trp Glu Gly Met Gln Ala Trp Gly  
 50 55 60  
 Lys Lys Asn Gly Leu Lys Lys Gly Ala Gly Phe Asp Tyr Phe Gln Ser  
 65 70 75 80  
 Ala Ser Glu Ser Asp Tyr Ala Thr Asn Leu Asp Thr Ala Val Ser Ser  
 85 90 95  
 Gly Tyr Lys Leu Ile Phe Gly Ile Gly Phe Ser Leu His Asp Ala Ile  
 100 105 110  
 Asp Lys Ala Ala Asp Asn Asn Lys Asp Val Asn Tyr Val Ile Val Asp  
 115 120 125  
 Asp Val Ile Lys Gly Lys Asp Asn Val Ala Ser Val Val Phe Ala Asp  
 130 135 140

Asn Glu Ser Ala Tyr Leu Ala Gly Ile Ala Ala Ala Lys Thr Thr Lys  
 145 150 155 160  
 Thr Lys Thr Val Gly Phe Val Gly Gly Met Glu Ser Glu Val Ile Thr  
 165 170 175  
 Arg Phe Glu Lys Gly Phe Glu Ala Gly Val Lys Ser Val Asp Lys Ser  
 180 185 190  
 Ile Lys Ile Lys Val Asp Tyr Ala Gly Ser Phe Gly Asp Ala Ala Lys  
 195 200 205  
 Gly Lys Thr Ile Ala Ala Ala Gln Tyr Ala Ser Gly Ala Asp Ile  
 210 215 220

<210> 49  
 <211> 609  
 <212> DNA  
 <213> Streptococcus agalactiae

<400> 49  
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 cttatgagtc aaaaaactat tgaacataag ttaaaagttg cagataaaga agctgctcct 180  
 ctctacgcta aaatcgacca tatccaacga catattgaag tcaaaaaagc aaaagattta 240  
 aaagttattg aattgtatat taacaaagat atcaaccaac tagagaagca aaataaacgt 300  
 ctactaacta aattctatac ttctattgat aatcaaacat gggatagcac aagtgaagtc 360  
 aaaaaattga ttgataagac aaccctatcc actaacgaaa aagatagatt aaaattatat 420  
 tttgaacaac gtgcttacct tgagacaagg ttgaacgacc gctatcaaaa atttgataac 480  
 tctattgaaa accaaaataa agaactaaaa atattaacgt caaaaataga aaaaatctat 540  
 caaaaacatg gtattacaaa agaggattaa aaaacttact atgctaaaaa aacagtacga 600  
 gctgactga 609

<210> 50  
 <211> 202  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 50  
 Met Leu His Ser Lys Lys Ile His Ser Leu Ser Leu Ile Ala Val Leu  
 1 5 10 15  
 Ser Leu Ala Thr Tyr Thr Ser Leu Gln Pro Asn His Val Ala Ala Glu  
 20 25 30  
 Gln Ser Gln Lys Thr Ser Thr Val Leu Met Ser Gln Lys Thr Ile Glu  
 35 40 45  
 His Lys Leu Lys Val Ala Asp Lys Glu Ala Ala Pro Leu Tyr Ala Lys  
 50 55 60  
 Ile Asp His Ile Gln Arg His Ile Glu Val Lys Lys Ala Lys Asp Leu  
 65 70 75 80

Lys Val Ile Glu Leu Tyr Ile Asn Lys Asp Ile Asn Gln Leu Glu Lys  
                     85                    90                    95  
 Gln Asn Lys Arg Leu Leu Thr Lys Phe Tyr Thr Ser Ile Asp Asn Gln  
                     100                    105                    110  
 Thr Trp Asp Ser Thr Ser Glu Val Lys Lys Leu Ile Asp Lys Thr Thr  
                     115                    120                    125  
 Leu Ser Thr Asn Glu Lys Asp Arg Leu Lys Leu Tyr Phe Glu Gln Arg  
                     130                    135                    140  
 Ala Tyr Leu Glu Thr Arg Leu Asn Asp Arg Tyr Gln Lys Phe Asp Asn  
                     145                    150                    155                    160  
 Ser Ile Glu Asn Gln Asn Lys Glu Leu Lys Ile Leu Thr Ser Lys Ile  
                     165                    170                    175  
 Glu Lys Ile Tyr Gln Lys His Gly Ile Thr Lys Glu Val Leu Lys Thr  
                     180                    185                    190  
 Tyr Tyr Ala Lys Lys Thr Val Arg Ala Asp  
                     195                    200

<210> 51  
 <211> 600  
 <212> DNA  
 <213> Streptococcus agalactiae

<400> 51  
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 tatgcattca tggttactaa agagtttgcc agacagaata aaatcaccaa gatctctgat 120  
 ctcaaaaagt tatcaacaac tatgaaggca ggggttgata gttcatggat gaatcgcgag 180  
 ggagatggat aacttgattt cgctaaaaca tacggttttg aattttcaca tatttaccct 240  
 atgcaaatg gcttagtcta tgatgcggtt gaaagtaaca aaatgcaatc tgtattaggc 300  
 tactccactg acggtcgtat ttcgagctat gatttagaaa ttttaaggga tgataaaaaa 360  
 ttctttcctc cttatgaagc ctctatgggt gtcaacaatt ctatcatcaa aaaagatcct 420  
 aaactaaaaa aattactcca tcgactcgat ggtaaaatca atttaaaaac gatgcaaaac 480  
 cttaattata tggtagatga taaactttta gaagcttggc gtaatcatgg tcatagctgt 540  
 ttctgtgtg aaattgttat ccgctcacia ttccacacia catacgagcc ggaagcataa 600

<210> 52  
 <211> 199  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 52  
 Leu Asn Ser Gln Lys Arg Tyr Asn Gln Thr Trp Tyr Pro Thr Tyr Gly  
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 Phe Ser Asp Thr Tyr Ala Phe Met Val Thr Lys Glu Phe Ala Arg Gln  
                     20                    25                    30

Asn Lys Ile Thr Lys Ile Ser Asp Leu Lys Lys Leu Ser Thr Thr Met  
 35 40 45  
 Lys Ala Gly Val Asp Ser Ser Trp Met Asn Arg Glu Gly Asp Gly Tyr  
 50 55 60  
 Thr Asp Phe Ala Lys Thr Tyr Gly Phe Glu Phe Ser His Ile Tyr Pro  
 65 70 75 80  
 Met Gln Ile Gly Leu Val Tyr Asp Ala Val Glu Ser Asn Lys Met Gln  
 85 90 95  
 Ser Val Leu Gly Tyr Ser Thr Asp Gly Arg Ile Ser Ser Tyr Asp Leu  
 100 105 110  
 Glu Ile Leu Arg Asp Asp Lys Lys Phe Phe Pro Pro Tyr Glu Ala Ser  
 115 120 125  
 Met Val Val Asn Asn Ser Ile Ile Lys Lys Asp Pro Lys Leu Lys Lys  
 130 135 140  
 Leu Leu His Arg Leu Asp Gly Lys Ile Asn Leu Lys Thr Met Gln Asn  
 145 150 155 160  
 Leu Asn Tyr Met Val Asp Asp Lys Leu Leu Glu Ala Trp Arg Asn His  
 165 170 175  
 Gly His Ser Cys Phe Leu Cys Glu Ile Val Ile Arg Ser Gln Phe His  
 180 185 190  
 Thr Thr Tyr Glu Pro Glu Ala  
 195

<210> 53  
 <211> 849  
 <212> DNA  
 <213> Streptococcus agalactiae

<400> 53  
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 actaagcaag caatgtcgtc taagcaagca atgtcgctcta agcaaattaa agataagaat 120  
 agtaaagaaa aggtgattac tgttgcaact tacagcaaac ctacatctac ctttttagat 180  
 ttgattaaag ataattgtaa agaaaaagga tatactttta aggttgatcat ggtctctgac 240  
 tatattcagg ctaacattgc tttagaaaac aaagaacatg atgctaacct tttacaacat 300  
 gaatttttca tgagtatctt taataaggaa aatgatgggc atctagtgtc aattacacca 360  
 atttatcatt cattggctgg tttttatggt caacatttga aaaatattgc cgagcttaaa 420  
 gacggtgcta aggtagcgat tccgtctgat cctgccata tgactagagc tctgctatta 480  
 ttgcaagaaa agaaacttat caccttaaag aatacgtcca aaaagaccaa ggctatcgaa 540  
 gatattatta ctaaccctaa aaaattacga attgaacctg tagcattact taacctcaat 600  
 caggcctatt ttgaatatga ccttgtcttt aatttcctg gatatgtgac aaaaatcaat 660  
 ctagttccta aaagggatag attattatat gagaaaaaac cagatatccg ttttgcaggt 720  
 gccttggtag ctcgtgaaga taataaaaaat agtgataaaa taaaagtact taaagaagta 780  
 ctaacaagta aagagattcg tcaatatatc actaaggaga ttccaagtga agcagacgtt 840  
 gcgttctag 849

<210> 54  
 <211> 282  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 54

Met Lys Lys Leu Leu Ser Leu Thr Cys Leu Ile Met Met Ser Leu Cys  
 1 5 10 15

Leu Val Ala Cys Thr Lys Gln Ala Met Ser Ser Lys Gln Ala Met Ser  
 20 25 30

Ser Lys Gln Ile Lys Asp Lys Asn Ser Lys Glu Lys Val Ile Thr Val  
 35 40 45

Ala Thr Tyr Ser Lys Pro Thr Ser Thr Phe Leu Asp Leu Ile Lys Asp  
 50 55 60

Asn Val Lys Glu Lys Gly Tyr Thr Leu Lys Val Val Met Val Ser Asp  
 65 70 75 80

Tyr Ile Gln Ala Asn Ile Ala Leu Glu Asn Lys Glu His Asp Ala Asn  
 85 90 95

Leu Leu Gln His Glu Phe Phe Met Ser Ile Phe Asn Lys Glu Asn Asp  
 100 105 110

Gly His Leu Val Ser Ile Thr Pro Ile Tyr His Ser Leu Ala Gly Phe  
 115 120 125

Tyr Gly Gln His Leu Lys Asn Ile Ala Glu Leu Lys Asp Gly Ala Lys  
 130 135 140

Val Ala Ile Pro Ser Asp Pro Ala Asn Met Thr Arg Ala Leu Leu Leu  
 145 150 155 160

Leu Gln Glu Lys Lys Leu Ile Thr Leu Lys Asn Thr Ser Lys Lys Thr  
 165 170 175

Lys Ala Ile Glu Asp Ile Ile Thr Asn Pro Lys Lys Leu Arg Ile Glu  
 180 185 190

Pro Val Ala Leu Leu Asn Leu Asn Gln Ala Tyr Phe Glu Tyr Asp Leu  
 195 200 205

Val Phe Asn Phe Pro Gly Tyr Val Thr Lys Ile Asn Leu Val Pro Lys  
 210 215 220

Arg Asp Arg Leu Leu Tyr Glu Lys Lys Pro Asp Ile Arg Phe Ala Gly  
 225 230 235 240

Ala Leu Val Ala Arg Glu Asp Asn Lys Asn Ser Asp Lys Ile Lys Val  
 245 250 255

Leu Lys Glu Val Leu Thr Ser Lys Glu Ile Arg His Tyr Ile Thr Lys  
 260 265 270

Glu Ile Pro Ser Glu Ala Asp Val Ala Phe  
 275 280

<210> 55

<211> 711

<212> DNA

<213> Streptococcus agalactiae

<400> 55

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ctgttggcta aggaaccac tatgtctgtc ctttggatc aaaattctgc agaagccaag 60
gctttatatt tacaagggtta taatgttgc aaaatgaagt tagatgattg gttacaaaag 120
cccagtgaag aaccatattc aattatctta gatttagatg aaacagtttt agataatagc 180
ccatatcaag caaagaatat taaagatggc tctagtttca cgccagagag ttgggataaa 240
tggttgcaaa agaaatcagc taaggctggt gcgggtgcca aagaattttt gaagtatgct 300
aatgaaaagg gaataaaaat ttattatgtc tcagatcgta cagatgctca agttgatgct 360
actaaagaaa atttagagaa ggaagggtata cctgttcaag ggaaagacca cttgcttttc 420
cttaaaaaag gaatgaaatc taaagagagt cgccgtcagg cagttcaaaa agataaccaat 480
ttaattatgc tttttggaga taatttagtt gattttgctg atttttctaa atcatctagt 540
acagatagag aacaactact aactaaactt caaagtgagt ttggtagtaa atttattggt 600
ttcccaaatc ctatgtacgg ttcttgggaa agtgctatct atcaaggaaa acatctggat 660
gttcaaaaac aattgaaaga acgacaaaaa atgttgcatt cgtatgatta a 711

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<210> 56

<211> 236

<212> PRT

<213> Streptococcus agalactiae

<400> 56

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Leu Leu Ala Lys Glu Thr Thr Met Ser Val Leu Trp Tyr Gln Asn Ser
1 5 10 15
Ala Glu Ala Lys Ala Leu Tyr Leu Gln Gly Tyr Asn Val Ala Lys Met
20 25 30
Lys Leu Asp Asp Trp Leu Gln Lys Pro Ser Glu Lys Pro Tyr Ser Ile
35 40 45
Ile Leu Asp Leu Asp Glu Thr Val Leu Asp Asn Ser Pro Tyr Gln Ala
50 55 60
Lys Asn Ile Lys Asp Gly Ser Ser Phe Thr Pro Glu Ser Trp Asp Lys
65 70 75 80
Trp Val Gln Lys Lys Ser Ala Lys Ala Val Ala Gly Ala Lys Glu Phe
85 90 95
Leu Lys Tyr Ala Asn Glu Lys Gly Ile Lys Ile Tyr Tyr Val Ser Asp
100 105 110
Arg Thr Asp Ala Gln Val Asp Ala Thr Lys Glu Asn Leu Glu Lys Glu
115 120 125
Gly Ile Pro Val Gln Gly Lys Asp His Leu Leu Phe Leu Lys Lys Gly
130 135 140
Met Lys Ser Lys Glu Ser Arg Arg Gln Ala Val Gln Lys Asp Thr Asn
145 150 155 160
Leu Ile Met Leu Phe Gly Asp Asn Leu Val Asp Phe Ala Asp Phe Ser
165 170 175

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Lys Ser Ser Ser Thr Asp Arg Glu Gln Leu Leu Thr Lys Leu Gln Ser  
 180 185 190  
 Glu Phe Gly Ser Lys Phe Ile Val Phe Pro Asn Pro Met Tyr Gly Ser  
 195 200 205  
 Trp Glu Ser Ala Ile Tyr Gln Gly Lys His Leu Asp Val Gln Lys Gln  
 210 215 220  
 Leu Lys Glu Arg Gln Lys Met Leu His Ser Tyr Asp  
 225 230 235

<210> 57  
 <211> 128  
 <212> DNA  
 <213> Streptococcus agalactiae

<400> 57  
 atggataata aaggtataata cgccaatgtg attgatgcaa tcgctgaggg tgcaagcaca 60  
 ggtgcacaaa tggctttctc aattggtgct agtttgattg cctttgttgg tttagtttct 120  
 ttgattaa 128

<210> 58  
 <211> 42  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 58  
 Met Asp Asn Lys Gly Asn Asn Ala Asn Val Ile Asp Ala Ile Ala Glu  
 1 5 10 15

Gly Ala Ser Thr Gly Ala Gln Met Ala Phe Ser Ile Gly Ala Ser Leu  
 20 25 30

Ile Ala Phe Val Gly Leu Val Ser Leu Ile  
 35 40

<210> 59  
 <211> 573  
 <212> DNA  
 <213> Streptococcus agalactiae

<400> 59  
 atgaaaaaga aaaacaaatc ctctaacatt gctataattg caatcttttt tgctattatg 60  
 cttgtcattc attttttgtc atcatttatt tttagttttt ggtagtccc tattaacact 120  
 actttgatgc atatccagc tattattgca tctatagcct atggacctcg tattggtgca 180  
 actctaggcg ccttaatggg ggggatcagc gtagctaaca gcagcattgt tctattacca 240  
 acgagttacc tcttctcacc ttttgttgaa aatggtaatt tttattcgct aattattgca 300  
 cttgtaccac gtattctaatt cgggattatt ccttatttcg tttacaaatt actacacaac 360  
 cgcttttggtt tggctatctc aggtgctata ggctctctaa caaacacagt atttggttta 420  
 tctggaattt ttatcttttt ttcaagtact tataatggga atatcaagct aatgctcgct 480  
 gggattattt catctaattc attagctgag atggtcattg cagctatcat tgtatatcta 540

actgatcctc gtattctcaa tattaacat taa

573

<210> 60  
<211> 190  
<212> PRT  
<213> Streptococcus agalactiae

<400> 60  
Met Lys Lys Lys Asn Lys Ser Ser Asn Ile Ala Ile Ile Ala Ile Phe  
1 5 10 15  
Phe Ala Ile Met Leu Val Ile His Phe Leu Ser Ser Phe Ile Phe Ser  
20 25 30  
Phe Trp Leu Val Pro Ile Lys Pro Thr Leu Met His Ile Pro Val Ile  
35 40 45  
Ile Ala Ser Ile Ala Tyr Gly Pro Arg Ile Gly Ala Thr Leu Gly Ala  
50 55 60  
Leu Met Gly Gly Ile Ser Val Ala Asn Ser Ser Ile Val Leu Leu Pro  
65 70 75 80  
Thr Ser Tyr Leu Phe Ser Pro Phe Val Glu Asn Gly Asn Phe Tyr Ser  
85 90 95  
Leu Ile Ile Ala Leu Val Pro Arg Ile Leu Ile Gly Ile Ile Pro Tyr  
100 105 110  
Phe Val Tyr Lys Leu Leu His Asn Arg Phe Gly Leu Ala Ile Ser Gly  
115 120 125  
Ala Ile Gly Ser Leu Thr Asn Thr Val Phe Val Leu Ser Gly Ile Phe  
130 135 140  
Ile Phe Phe Ser Ser Thr Tyr Asn Gly Asn Ile Lys Leu Met Leu Ala  
145 150 155 160  
Gly Ile Ile Ser Ser Asn Ser Leu Ala Glu Met Val Ile Ala Ala Ile  
165 170 175  
Ile Val Tyr Leu Thr Asp Pro Arg Ile Leu Asn Ile Lys His  
180 185 190

<210> 61  
<211> 251  
<212> DNA  
<213> Streptococcus agalactiae

<400> 61  
ttgaatatga cattacaaga cgaaatcaaa aaacgccgta cttttgccat catctctcac 60  
ccggatgctg gtaagacgac tattactgag caattattat attttggtgg tgaaattaga 120  
gaagcaggga cagtaaaagg gaaaaaatca ggtacttttg caaagtccga ctggatggat 180  
attgaaaagc aacgggggtat ctctgttact tcatctgtta tgcaatttga ttacgcgggt 240



aaacgtgtta a

251

<210> 62  
<211> 83  
<212> PRT  
<213> Streptococcus agalactiae

<400> 62  
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1 5 10 15  
Ile Ile Ser His Pro Asp Ala Gly Lys Thr Thr Ile Thr Glu Gln Leu  
20 25 30  
Leu Tyr Phe Gly Gly Glu Ile Arg Glu Ala Gly Thr Val Lys Gly Lys  
35 40 45  
Lys Ser Gly Thr Phe Ala Lys Ser Asp Trp Met Asp Ile Glu Lys Gln  
50 55 60  
Arg Gly Ile Ser Val Thr Ser Ser Val Met Gln Phe Asp Tyr Ala Gly  
65 70 75 80  
Lys Arg Val

<210> 63  
<211> 303  
<212> DNA  
<213> Streptococcus agalactiae

<400> 63  
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aaaattgaaa agcctgctct ttcgtttatg caagatgcgt ggcgtcgctt gaaaaaaaaac 120  
aaattagcag tagtttcact ctatttatta gctcttttac ttactttttc gttagcctca 180  
aatttatttg taactcagaa ggatgctaatt gggtttgatt cgaaaaaagt aacgacatat 240  
cgcaacttac cacctaaatt gagttcaaac cttccttttt ggaatggtag cattaatcca 300  
tca 303

<210> 64  
<211> 101  
<212> PRT  
<213> Streptococcus agalactiae

<400> 64  
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1 5 10 15  
Ser Thr Gln Glu Lys Ile Glu Lys Pro Ala Leu Ser Phe Met Gln Asp  
20 25 30  
Ala Trp Arg Arg Leu Lys Lys Asn Lys Leu Ala Val Val Ser Leu Tyr  
35 40 45

Leu Leu Ala Leu Leu Leu Thr Phe Ser Leu Ala Ser Asn Leu Phe Val  
           50                          55                          60  
 Thr Gln Lys Asp Ala Asn Gly Phe Asp Ser Lys Lys Val Thr Thr Tyr  
           65                          70                          75                          80  
 Arg Asn Leu Pro Pro Lys Leu Ser Ser Asn Leu Pro Phe Trp Asn Gly  
                           85                          90                          95  
 Ser Ile Asn Pro Ser  
                           100

<210> 65  
 <211> 154  
 <212> DNA  
 <213> Streptococcus agalactiae

<400> 65  
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 tacacaccaa taaacctagc tacaaatcat accacagaaa atattgttac tgctcaagag 120  
 tataaaacaa agagaatggg actttacctt ttaa 154

<210> 66  
 <211> 51  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 66  
 Met Lys Arg Lys Gln Phe Ile Lys Leu Gly Ile Ala Thr Leu Leu Thr  
           1                          5                          10                          15  
 Val Ile Ser Leu Tyr Thr Pro Ile Asn Leu Ala Thr Asn His Thr Thr  
                           20                          25                          30  
 Glu Asn Ile Val Thr Ala Gln Glu Tyr Lys Thr Lys Glu Asn Ile Leu  
           35                          40                          45  
 Phe Leu Leu  
           50

<210> 67  
 <211> 144  
 <212> DNA  
 <213> Streptococcus agalactiae

<400> 67  
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 aagaaaaaat ggcaattacc gacatttact ttcattgggt tgctatttat ctataaccaa 120  
 gggctgtggg aacagttgat taat 144

<210> 68  
 <211> 48  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 68  
 Met Phe Tyr Asn Pro Leu Leu Phe Ile Val Leu Ile Thr Ile Ala Val  
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                     20                    25                    30  
 Gly Leu Leu Phe Ile Tyr Asn Gln Gly Leu Trp Glu Gln Leu Ile Asn  
                     35                    40                    45

<210> 69  
 <211> 453  
 <212> DNA  
 <213> Streptococcus agalactiae

<400> 69  
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 atactaggag gctgtcaa atgaatagtg cataaaagtc agtataatga aacaaaaagt 120  
 agcaagcaat cagaagtga gaaagataaa aaaatgacaa aaaaagaaca attagcttat 180  
 ctcaaagagc atgaacaaga aataattgat tttgtaaaat ctcagaataa aaagatagaa 240  
 tctgtacaaa ttgattggaa tgatgttcga tggagtaaag ggggaaatgg tacacctcaa 300  
 ggaggaggag aggggatttt actttttggg gagattaata atgattctga atcaagttgg 360  
 agagttgata ttgatataga aaaaggacgg ctagacctaa aaaatatgta tttaggacaa 420  
 cctatacgaa ttggaggtaa attatttgag taa 453

<210> 70  
 <211> 150  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 70  
 Met Val Gln Ile Met Lys Lys His Ile Lys Ser Ile Ile Pro Ile Val  
     1                    5                    10                    15  
 Leu Ile Gly Met Ile Leu Gly Gly Cys Gln Met Asn Ser Glu His Lys  
                     20                    25                    30  
 Ser Gln Tyr Asn Glu Thr Lys Ser Ser Lys Gln Ser Glu Val Lys Lys  
                     35                    40                    45  
 Asp Lys Lys Met Thr Lys Lys Glu Gln Leu Ala Tyr Leu Lys Glu His  
                     50                    55                    60  
 Glu Gln Glu Ile Ile Asp Phe Val Lys Ser Gln Asn Lys Lys Ile Glu  
                     65                    70                    75                    80

Ser Val Gln Ile Asp Trp Asn Asp Val Arg Trp Ser Lys Gly Gly Asn  
85 90 95

Gly Thr Pro Gln Gly Gly Gly Glu Gly Ile Leu Leu Phe Gly Glu Ile  
100 105 110

Asn Asn Asp Ser Glu Ser Ser Trp Arg Val Asp Ile Asp Ile Glu Lys  
115 120 125

Gly Arg Leu Asp Leu Lys Asn Met Tyr Leu Gly Gln Pro Ile Arg Ile  
130 135 140

Gly Gly Lys Leu Phe Glu  
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<210> 71

<211> 1455

<212> DNA

<213> Streptococcus agalactiae

<400> 71

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caagaagatg aatcagagct agatgaatat gaactaggaa tggcacaaaa cgctaagaaa 1380
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<210> 72

<211> 485

<212> PRT

<213> Streptococcus agalactiae

<400> 72

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Leu Glu Leu Glu Ala Thr Arg Met Val Ala Glu His Arg Gly His His	35	40	45
Ile Asp Ala Leu Gly Lys Lys Asp Ser Thr Glu Lys Pro Lys His Ile	50	55	60
Ser His Glu Pro Asn Lys Glu Pro His Thr Glu Glu Glu His His Ala	65	70	75
Val Thr Pro Lys Asp Gln Arg Lys Gly Lys Pro Asn Ser Gln Ile Val	85	90	95
Tyr Ser Ala Gln Glu Ile Glu Glu Ala Lys Lys Ala Gly Lys Tyr Thr	100	105	110
Thr Ser Asp Gly Tyr Ile Phe Asp Ala Lys Asp Ile Lys Lys Asp Thr	115	120	125
Gly Thr Gly Tyr Val Ile Pro His Met Thr His Glu His Trp Val Pro	130	135	140
Lys Lys Asp Leu Ser Glu Ser Glu Leu Lys Ala Ala Gln Glu Phe Leu	145	150	155
Ser Gly Lys Ser Glu Ala Asn Gln Asp Lys Pro Lys Thr Gly Lys Thr	165	170	175
Ala Gln Glu Ile Tyr Glu Ala Ile Glu Pro Lys Ala Ile Val Lys Pro	180	185	190
Glu Asp Leu Leu Phe Gly Ile Ala Gln Ala Thr Asp Tyr Lys Asn Gly	195	200	205
Thr Phe Val Ile Pro His Lys Asp His Tyr His Tyr Val Glu Leu Lys	210	215	220
Trp Phe Asp Glu Glu Lys Asp Leu Leu Ala Asp Ser Asp Lys Thr Tyr	225	230	235
Ser Leu Glu Asp Tyr Leu Ala Thr Ala Lys Tyr Tyr Met Met His Pro	245	250	255
Glu Lys Arg Pro Lys Val Glu Gly Trp Gly Lys Asp Ala Glu Ile Tyr	260	265	270
Lys Glu Lys Asp Ser Asn Lys Ala Asp Lys Pro Ser Pro Ala Pro Thr	275	280	285
Asp Asn Lys Ser Thr Ser Asn Ser Ser Asp Lys Asn Leu Ser Ala Ala	290	295	300
Glu Val Phe Lys Gln Ala Lys Pro Glu Lys Ile Val Pro Leu Asp Lys			

305                      310                      315                      320  
 Ile Ala Ala His Met Ala Tyr Ala Val Gly Phe Glu Asp Asp Gln Leu  
                                  325                      330                      335  
 Ile Val Pro His His Asp His Tyr His Asn Val Pro Met Ala Trp Phe  
                                  340                      345                      350  
 Asp Lys Gly Gly Leu Trp Lys Ala Pro Glu Gly Tyr Thr Leu Gln Gln  
                                  355                      360                      365  
 Leu Phe Ser Thr Ile Lys Tyr Tyr Met Glu His Pro Asn Glu Leu Pro  
                                  370                      375                      380  
 Lys Glu Lys Gly Trp Gly His Asp Ser Asp His Asn Lys Gly Ser Asn  
                                  385                      390                      395                      400  
 Lys Asp Asn Lys Ala Lys Asn Tyr Ala Pro Asp Glu Glu Pro Glu Asp  
                                  405                      410                      415  
 Ser Gly Lys Val Thr His Asn Tyr Gly Phe Tyr Asp Val Asn Lys Gly  
                                  420                      425                      430  
 Ser Asp Glu Glu Glu Pro Glu Lys Gln Glu Asp Glu Ser Glu Leu Asp  
                                  435                      440                      445  
 Glu Tyr Glu Leu Gly Met Ala Gln Asn Ala Lys Lys Tyr Gly Met Asp  
                                  450                      455                      460  
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                                  465                      470                      475                      480  
 Val Ser Phe Glu Ser  
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<210> 73  
 <211> 855  
 <212> DNA  
 <213> Streptococcus agalactiae

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caattagtaa aataa

855

<210> 74

<211> 284

<212> PRT

<213> Streptococcus agalactiae

<400> 74

Met Arg Lys Arg Phe Ser Leu Leu Asn Phe Ile Val Val Thr Phe Ile  
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Phe Phe Phe Phe Ile Leu Phe Pro Leu Phe Lys Ala Lys Asp Cys Gln  
20 25 30

Val Val Tyr Ala Ser Phe Gln Gly Asp His Trp Asp Ile Cys Asn Ala  
35 40 45

Phe Asp Phe Pro Tyr Leu His Arg Phe Asp Leu Ile Lys Gly Lys Glu  
50 55 60

Asn Gln Leu Tyr Phe Ile Gly Cys Thr Ile Ala Asn Ser Lys Ala Tyr  
65 70 75 80

Thr Glu Asp Trp Ser Asp Lys Gly Arg Ile Phe Val Ala Arg Phe Asn  
85 90 95

Thr Gln Asn His Thr Leu Glu Gly Leu Gln Gln Leu Pro Gln Thr Leu  
100 105 110

Leu Lys Asn His Gly Tyr Tyr Ala Ile Gln Asp Glu Gly Tyr Ser Leu  
115 120 125

Ile Thr Ser Val Glu Gly Val Leu Lys Leu Thr Tyr Pro Glu Phe Ser  
130 135 140

Thr Thr Gly Asp Trp Gln Leu Glu Arg Leu Phe Asp Glu Glu Thr Ser  
145 150 155 160

Asp Val Val Lys Val Asp Ile Asn Gln Asp Gly Lys Asp Glu Tyr Val  
165 170 175

Ile Ile Gln Gly Phe His Gly Asp Arg Leu Arg Ile Phe Thr Glu Asp  
180 185 190

Phe Gly Arg Glu Leu Phe His Tyr Pro Glu Lys Thr Pro Phe Gly His  
195 200 205

Ala Ile Trp Ser Gly Arg Leu Leu Asn Gln Thr Cys Phe Val Phe Gly  
210 215 220

Trp Arg Ser Glu Lys Ala Glu Leu Arg Leu Phe His Phe Val Asp Gly  
225 230 235 240

His Leu Val Ser Glu Leu Val Asp Ala Lys Ala Ala Ser Ser Asn Val  
245 250 255

Leu Ala Phe Glu Lys Asp Gly Lys Ala Tyr Leu Phe Ser Ala Asn Asn  
 260 265 270

Gly Arg Gly Glu Val Ala Leu Tyr Gln Leu Val Lys  
 275 280

<210> 75  
 <211> 2070  
 <212> DNA  
 <213> Streptococcus agalactiae

<400> 75  
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 aataataaag tcacaaacta caaacaacta aaaggaaaag tagtcggtgt aaaaaatgga 420  
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 gacgatcaac cagttgtgca atttgcgata aatcaaggaa aagcttacgc cattaacatg 600  
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 acgaaaattg ctaaacagca aggttttaaa cttgatatct caaatccagg ttttgatgcc 960  
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<210> 76  
 <211> 689  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 76



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Asp Thr Ala Tyr Ala Pro Phe Glu Phe Lys Asp Ser Asp Gln Thr Tyr  
35 40 45  
Lys Gly Ile Asp Val Asp Ile Val Asn Glu Val Ala Lys Arg Ala Gly  
50 55 60  
Trp Asn Val Asn Met Thr Tyr Pro Gly Phe Asp Ala Ala Val Asn Ala  
65 70 75 80  
Val Gln Ser Gly Gln Ala Asp Ala Leu Met Ala Gly Thr Thr Val Thr  
85 90 95  
Glu Ala Arg Lys Lys Val Phe Asn Phe Ser Asp Thr Tyr Tyr Asp Thr  
100 105 110  
Ser Val Ile Leu Tyr Thr Lys Asn Asn Asn Lys Val Thr Asn Tyr Lys  
115 120 125  
Gln Leu Lys Gly Lys Val Val Gly Val Lys Asn Gly Thr Ala Ala Gln  
130 135 140  
Ser Phe Leu Glu Glu Asn Lys Ser Lys Tyr Gly Tyr Lys Val Lys Thr  
145 150 155 160  
Phe Asp Thr Ser Asp Leu Met Asn Asn Ser Leu Asp Ser Gly Ser Ile  
165 170 175  
Tyr Ala Ala Met Asp Asp Gln Pro Val Val Gln Phe Ala Ile Asn Gln  
180 185 190  
Gly Lys Ala Tyr Ala Ile Asn Met Glu Gly Glu Ala Val Gly Ser Phe  
195 200 205  
Ala Phe Ala Val Lys Lys Gly Ser Gly His Asp Asn Leu Ile Lys Glu  
210 215 220  
Phe Asn Thr Ala Phe Ala Gln Met Lys Ser Asp Gly Thr Tyr Asn Asp  
225 230 235 240  
Ile Met Asp Lys Trp Leu Gly Lys Asp Ala Thr Lys Thr Ser Gly Lys  
245 250 255  
Ala Thr Gly Asn Ala Asn Glu Lys Ala Thr Pro Val Lys Pro Ser Tyr  
260 265 270  
Lys Ile Val Ser Asp Ser Ser Phe Ala Pro Phe Glu Tyr Gln Asn Gly  
275 280 285  
Lys Gly Lys Tyr Thr Gly Phe Asp Met Glu Leu Ile Thr Lys Ile Ala  
290 295 300

Lys Gln Gln Gly Phe Lys Leu Asp Ile Ser Asn Pro Gly Phe Asp Ala  
 305 310 315 320  
 Ala Leu Asn Ala Val Gln Ser Gly Gln Ala Asp Gly Val Ile Ala Gly  
 325 330 335  
 Ala Thr Ile Thr Glu Ala Arg Gln Lys Ile Phe Asp Phe Ser Asp Pro  
 340 345 350  
 Tyr Tyr Thr Ser Ser Val Ile Leu Ala Val Lys Lys Gly Ser Asn Val  
 355 360 365  
 Lys Ser Tyr Gln Asp Leu Lys Gly Lys Thr Val Gly Ala Lys Asn Gly  
 370 375 380  
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 385 390 395 400  
 His Val Lys Ala Phe Asp Glu Ala Ser Thr Met Tyr Asp Ser Met Asn  
 405 410 415  
 Ser Gly Ser Ile Asp Ala Leu Met Asp Asp Glu Ala Val Leu Ala Tyr  
 420 425 430  
 Ala Ile Asn Gln Gly Arg Lys Phe Glu Thr Pro Ile Lys Gly Glu Lys  
 435 440 445  
 Ser Gly Asp Ile Gly Phe Ala Val Lys Lys Gly Ala Asn Pro Glu Leu  
 450 455 460  
 Ile Lys Met Phe Asn Asn Gly Leu Ala Ser Leu Lys Lys Ser Gly Glu  
 465 470 475 480  
 Tyr Asp Lys Leu Val Lys Lys Tyr Leu Ser Thr Ala Ser Thr Ser Ser  
 485 490 495  
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 Ile Ser Asn Asn Tyr Lys Gln Leu Leu Ser Gly Ile Gly Thr Thr Leu  
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 Ser Leu Thr Leu Ile Ser Phe Ala Ile Ala Met Val Ile Gly Ile Ile  
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 Phe Gly Met Met Ser Val Ser Pro Ser Asn Thr Leu Arg Thr Ile Ser  
 545 550 555 560  
 Met Ile Phe Val Asp Ile Val Arg Gly Ile Pro Leu Met Ile Val Ala  
 565 570 575  
 Ala Phe Ile Phe Trp Gly Ile Pro Asn Leu Ile Glu Ser Ile Thr Gly  
 580 585 590  
 His Gln Ser Pro Ile Asn Asp Phe Val Ala Ala Thr Ile Ala Leu Ser  
 595 600 605

Leu Asn Gly Gly Ala Tyr Ile Ala Glu Ile Val Arg Gly Gly Ile Glu  
610 615 620

Ala Val Pro Ser Gly Gln Met Glu Ala Ser Arg Ser Leu Gly Ile Ser  
625 630 635 640

Tyr Gly Lys Thr Met Gln Lys Val Ile Leu Pro Gln Ala Val Arg Leu  
645 650 655

Met Leu Pro Asn Phe Ile Asn Gln Phe Val Ile Ser Leu Lys Asp Thr  
660 665 670

Thr Ile Val Ser Ala Ile Gly Leu Val Glu Leu Phe Gln Thr Gly Lys  
675 680 685

Ser

<210> 77  
<211> 149  
<212> DNA  
<213> Streptococcus agalactiae

<400> 77  
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agtaataaaa ttggagggcg tccaaatcaa caaacatttg gaatgacttt aggagcattg 120  
ctatttgcga ttatcgtatg tttatttaa 149

<210> 78  
<211> 49  
<212> PRT  
<213> Streptococcus agalactiae

<400> 78  
Met Glu Gly Leu Leu Ile Ala Leu Ile Pro Met Phe Ala Trp Gly Ser  
1 5 10 15

Ile Gly Phe Val Ser Asn Lys Ile Gly Gly Arg Pro Asn Gln Gln Thr  
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Phe Gly Met Thr Leu Gly Ala Leu Leu Phe Ala Ile Ile Val Cys Leu  
35 40 45

Phe

<210> 79  
<211> 963  
<212> DNA  
<213> Streptococcus agalactiae

<400> 79

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tatcaacaag aagaatattc tttatatgaa ataggttatt cttggaatct agatttcaca 660
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<210> 80

<211> 320

<212> PRT

<213> Streptococcus agalactiae

<400> 80

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Met Asn Thr Ile Tyr Asn Thr Leu Arg Thr Asp Lys Gly Tyr Lys Val
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Tyr Glu Gly Tyr Leu Tyr Glu Ile Thr Gly Glu Glu Cys Glu Glu Ala
      20                      25                      30

Leu Asp Leu Val Ile Pro Lys Asn Ile Val Phe Ala Asp Thr Asp Thr
      35                      40                      45

Cys Gly Tyr Thr Phe Leu Leu Asn Glu Asp Gly Thr Val Tyr Asp Asp
      50                      55                      60

Val Thr Phe Tyr Lys Phe Asp Asp Lys Tyr Trp Leu Ala Ser His Lys
      65                      70                      75                      80

Ala Leu Asp Ser Tyr Leu Asp Asn Ile Asn Phe Asp Tyr Thr Val Thr
      85                      90                      95

Asp Ile Ser Asp Glu Tyr Lys Met Leu Gln Ile Glu Gly Arg Tyr Ser
      100                      105                      110

Gly Glu Ile Ala Gln Ser Phe Tyr Glu Tyr Asp Ile Ser Thr Leu Asn
      115                      120                      125

Phe Arg Thr Leu Arg Ile Glu Met Asp Phe Ile Lys Gly Glu Glu Arg
      130                      135                      140

Leu Ser Trp Arg Arg Phe Gly Phe Ser Gly Glu Phe Gly Tyr Gln Phe
      145                      150                      155                      160

Phe Leu Pro Ser Ser Ile Phe Ala Thr Phe Val Ser Asp Val Cys Glu
      165                      170                      175

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Gly Ile Ala Glu Cys Gly Asp Glu Leu Asp Arg Tyr Leu Arg Phe Glu  
 180 185 190

Val Gly Gln Pro Ile Thr Asp Ile Tyr Gln Gln Glu Glu Tyr Ser Leu  
 195 200 205

Tyr Glu Ile Gly Tyr Ser Trp Asn Leu Asp Phe Thr Lys Glu Glu Phe  
 210 215 220

Arg Gly Arg Asp Ser Leu Leu Glu His Ile Arg Ser Ala Thr Val Lys  
 225 230 235 240

Ser Val Gly Phe Ser Thr Lys Glu Lys Leu Ala Ser Gly Thr Pro Val  
 245 250 255

Leu Phe Asp Asp Gln Ile Val Gly Lys Ile Phe Trp Ile Ala Asp Glu  
 260 265 270

Lys His Ser Ser Glu Asn Tyr Leu Gly Leu Met Ile Val Asn Gln Thr  
 275 280 285

Tyr Ala His Ser Gly Val Thr Phe Val Thr Glu Asp Gly Gln Ile Leu  
 290 295 300

Lys Thr Gln Ser Ser Pro Tyr Cys Ile Pro Glu Ser Trp Asn Lys Glu  
 305 310 315 320

<210> 81  
 <211> 702  
 <212> DNA  
 <213> Streptococcus agalactiae

<400> 81  
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 aaaacaactt tatttaatat actttatggg gatcttgcag ctgacaacgg gaccatttgt 180  
 ttattgaagg ataatacaga gtatcctctt accgataagg atattggtat tgtttattcc 240  
 gaaaactacc ttccagaatt tttaacaggg tatgaatttg taaaatttta catggattta 300  
 catccttcag atgatttaat gacaatagat gattatttag attttatgga aataggacaa 360  
 acagagcgtc atagaattat caaaggatat tctgatggaa tgaagagtaa gctctcatta 420  
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 attatattat caactcatat aatggcctta gcagaagatc tatgtgatat tgtggctgta 600  
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 cgtcttcttc aagtgttgaa gggagatgaa tatgacaagt aa 702

<210> 82  
 <211> 233  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 82

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Val Leu Arg Gly Ala Ser Tyr Arg Phe Tyr Ser Gly Lys Ile Thr Gly  
20 25 30

Val Leu Gly Arg Asn Gly Ala Gly Lys Thr Thr Leu Phe Asn Ile Leu  
35 40 45

Tyr Gly Asp Leu Ala Ala Asp Asn Gly Thr Ile Cys Leu Leu Lys Asp  
50 55 60

Asn His Glu Tyr Pro Leu Thr Asp Lys Asp Ile Gly Ile Val Tyr Ser  
65 70 75 80

Glu Asn Tyr Leu Pro Glu Phe Leu Thr Gly Tyr Glu Phe Val Lys Phe  
85 90 95

Tyr Met Asp Leu His Pro Ser Asp Asp Leu Met Thr Ile Asp Asp Tyr  
100 105 110

Leu Asp Phe Met Glu Ile Gly Gln Thr Glu Arg His Arg Ile Ile Lys  
115 120 125

Gly Tyr Ser Asp Gly Met Lys Ser Lys Leu Ser Leu Ile Cys Leu Met  
130 135 140

Ile Ser Lys Pro Lys Val Ile Leu Leu Asp Glu Pro Leu Thr Ala Val  
145 150 155 160

Asp Val Val Ser Ser Ile Ala Ile Lys Arg Leu Leu Leu Glu Leu Ser  
165 170 175

Glu Asp His Ile Ile Ile Leu Ser Thr His Ile Met Ala Leu Ala Glu  
180 185 190

Asp Leu Cys Asp Ile Val Ala Val Leu Asp Lys Gly Lys Leu Gln Thr  
195 200 205

Leu Asp Ile Asp Arg Lys His Glu Gln Phe Glu Glu Arg Leu Leu Gln  
210 215 220

Val Leu Lys Gly Asp Glu Tyr Asp Lys  
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<210> 83

<211> 774

<212> DNA

<213> Streptococcus agalactiae

<400> 83

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gtcttttttaa tacgtgacgg tcaaatggat ggtcaacgta ttcataat ttt tgaagaacta 180  
cctctttctg gaggatcact tgacggtgac aaacgacctg atatcggttt tgtaacgcgt 240  
ggtggcgctg aaatggaaaa tcacttcgaa tgtatgtggg atatgtaccg ttccatcccc 300  
tctctcgaag ttccagatgc ttcttatcta gatgaat ttt attggcttga caaggatgat 360  
cccaattcat ctaactgctg cctcattcat aaacagggga atcgcttaga atctgatggt 420  
gattttacac tcggaacaca ttccaaagag ttagttaagc tagtcatgga gactgaagag 480  
tcttttaggtg ctaagacgat tgaagaagtt ttttcaaaag aattttttga aagtaat ttt 540  
tggacttatt gggctactat gtttgccttt gagaaatggc attcagcgat tgaaatgcgt 600  
cgatatgcta tgcgctttat ccatcatatt ggtggctctg ctgatttcac ttcattaaaa 660  
ttaataaat ataataata tgattctatg gtgaaaccaa tcatcagtta ttagagtgct 720  
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<210> 84

<211> 258

<212> PRT

<213> Streptococcus agalactiae

<400> 84

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			20					25					30		
Gly	Leu	Ala	Gly	Leu	Ala	Ala	Ala	Val	Phe	Leu	Ile	Arg	Asp	Gly	Gln
	35					40						45			
Met	Asp	Gly	Gln	Arg	Ile	His	Ile	Phe	Glu	Glu	Leu	Pro	Leu	Ser	Gly
	50					55					60				
Gly	Ser	Leu	Asp	Gly	Val	Lys	Arg	Pro	Asp	Ile	Gly	Phe	Val	Thr	Arg
65					70					75					80
Gly	Gly	Arg	Glu	Met	Glu	Asn	His	Phe	Glu	Cys	Met	Trp	Asp	Met	Tyr
			85						90					95	
Arg	Ser	Ile	Pro	Ser	Leu	Glu	Val	Pro	Asp	Ala	Ser	Tyr	Leu	Asp	Glu
			100					105					110		
Phe	Tyr	Trp	Leu	Asp	Lys	Asp	Asp	Pro	Asn	Ser	Ser	Asn	Cys	Arg	Leu
	115						120					125			
Ile	His	Lys	Gln	Gly	Asn	Arg	Leu	Glu	Ser	Asp	Gly	Asp	Phe	Thr	Leu
	130					135					140				
Gly	Thr	His	Ser	Lys	Glu	Leu	Val	Lys	Leu	Val	Met	Glu	Thr	Glu	Glu
145					150					155					160
Ser	Leu	Gly	Ala	Lys	Thr	Ile	Glu	Glu	Val	Phe	Ser	Lys	Glu	Phe	Phe
			165						170					175	
Glu	Ser	Asn	Phe	Trp	Thr	Tyr	Trp	Ala	Thr	Met	Phe	Ala	Phe	Glu	Lys
		180						185					190		
Trp	His	Ser	Ala	Ile	Glu	Met	Arg	Arg	Tyr	Ala	Met	Arg	Phe	Ile	His
		195					200					205			

His Ile Gly Gly Leu Pro Asp Phe Thr Ser Leu Lys Phe Asn Lys Tyr  
 210 215 220

Asn Gln Tyr Asp Ser Met Val Lys Pro Ile Ile Ser Tyr Leu Glu Ser  
 225 230 235 240

His Asn Val Asp Val Gln Phe Asp Ser Lys Val Thr Asn Ile Ser Val  
 245 250 255

Asp Phe

<210> 85  
 <211> 903  
 <212> DNA  
 <213> Streptococcus agalactiae

<400> 85  
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 actatcttag gtaagtcta tatcaataaa gtaacagctc acaaaataaa actctataac 180  
 tctcgaatga ctcctactat tttaatttca ggatccagtg ctactcaaga acgatttaac 240  
 agcatgttag cacagctcaa ccaaatggga gaaaaacata gcgtttttaa gttaactgtc 300  
 aaaaaagaca atagcattat ctacaatgga caaattagcg gcaatgacca caaaccttac 360  
 attgtcattg gatttgaaaa taatgaagat gggttatagta acatcaaaaa acaaacaaaa 420  
 tggctacaga ttgctatgaa tgatcttcag aagaaatata aatttaaacy ttttaacgct 480  
 atcgggtcatt caaatgggtg cttatcatgg actattttcc tagaagatta ttacgactct 540  
 gatgaatttg atatgaaatc attgttaaca atgggaacac cttttaactt tgaagaaagt 600  
 aacacctcaa atcatactca aatgcttaaa gatttaataca gtaataaagg aaatattcca 660  
 tcaagtctca tggatataca tttggcagga actaattcat atgatggtga taaaattggt 720  
 ccatttgcta gtgtggagac tggtaaataat attttccaag aaaccgctaa aactataacc 780  
 caactaacag taactggtaa taatgctaca cattctgact tgcctgataa tcctgaagtt 840  
 atccaatatg tcgcagaaaa aattcttaaa aatgagaaag gtaaattacc aaaacctcac 900  
 taa 903

<210> 86  
 <211> 300  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 86  
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 Phe Ile Ile Ile Leu Ile Gly Met Thr Ile Leu Gly Lys Ser Tyr Ile  
 35 40 45  
 Asn Lys Val Thr Ala His Lys Ile Lys Leu Tyr Asn Ser Arg Met Thr  
 50 55 60



Pro Thr Ile Leu Ile Ser Gly Ser Ser Ala Thr Gln Glu Arg Phe Asn  
 65 70 75 80  
 Ser Met Leu Ala Gln Leu Asn Gln Met Gly Glu Lys His Ser Val Leu  
 85 90 95  
 Lys Leu Thr Val Lys Lys Asp Asn Ser Ile Ile Tyr Asn Gly Gln Ile  
 100 105 110  
 Ser Gly Asn Asp His Lys Pro Tyr Ile Val Ile Gly Phe Glu Asn Asn  
 115 120 125  
 Glu Asp Gly Tyr Ser Asn Ile Lys Lys Gln Thr Lys Trp Leu Gln Ile  
 130 135 140  
 Ala Met Asn Asp Leu Gln Lys Lys Tyr Lys Phe Lys Arg Phe Asn Ala  
 145 150 155 160  
 Ile Gly His Ser Asn Gly Gly Leu Ser Trp Thr Ile Phe Leu Glu Asp  
 165 170 175  
 Tyr Tyr Asp Ser Asp Glu Phe Asp Met Lys Ser Leu Leu Thr Met Gly  
 180 185 190  
 Thr Pro Phe Asn Phe Glu Glu Ser Asn Thr Ser Asn His Thr Gln Met  
 195 200 205  
 Leu Lys Asp Leu Ile Ser Asn Lys Gly Asn Ile Pro Ser Ser Leu Met  
 210 215 220  
 Val Tyr Asn Leu Ala Gly Thr Asn Ser Tyr Asp Gly Asp Lys Ile Val  
 225 230 235 240  
 Pro Phe Ala Ser Val Glu Thr Gly Lys Tyr Ile Phe Gln Glu Thr Ala  
 245 250 255  
 Lys His Tyr Thr Gln Leu Thr Val Thr Gly Asn Asn Ala Thr His Ser  
 260 265 270  
 Asp Leu Pro Asp Asn Pro Glu Val Ile Gln Tyr Val Ala Glu Lys Ile  
 275 280 285  
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 290 295 300

<210> 87

<211> 912

<212> DNA

<213> Streptococcus agalactiae

<400> 87

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 gggttagatg tatatggtat tggagagcac catcgtgaag attttgcggt ctctgcaccc 180  
 gaaattatcc tagcagcagg agcgggttaga actaataata tccgtttatc tagtgcagta 240

acgattctct cttccaatga tctatttcgc gtctatcagc aattttcaac gattgacgca 300  
 ctttcaaagt gtagagcaga aattatggca gggcgtgggt cctttattga gtcttttcca 360  
 ttgtttggat acgatttagc ggattatgat gatttattta atgaaaaaat ggatatgttg 420  
 ttagcaatta actcagcgac aaatctcgat tggaaagggtc atttgacaca aacagttaat 480  
 gagcgaccaa tttatccaag agcattacaa agacagttat caatatgggt ggcaacagga 540  
 ggaaatgttg attctacaat tcgtattgca gaacaagggt tgccaattgt ttatgcaact 600  
 attggtggga atcccaaagc ctttcgtcaa ttggtccata tttataaaga agttggtaag 660  
 tccgtaatgg acacaaacca ggaacaacta aaagttgctg ctactcttg gggatggatt 720  
 gaagaggata atcaaacgcg tattgaccgt tttttttcc ctacgaaaca gaccgtcgat 780  
 aatattgcta agggagcgcc tcattggtct gaaatgacta aagagcagta tttacgttca 840  
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 ggacttttgg ga 912

<210> 88

<211> 303

<212> PRT

<213> Streptococcus agalactiae

<400> 88

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 20 25 30

Glu Ile Glu Leu Ala Asp Gln Val Gly Leu Asp Val Tyr Gly Ile Gly  
 35 40 45

Glu His His Arg Glu Asp Phe Ala Val Ser Ala Pro Glu Ile Ile Leu  
 50 55 60

Ala Ala Gly Ala Val Arg Thr Asn Asn Ile Arg Leu Ser Ser Ala Val  
 65 70 75 80

Thr Ile Leu Ser Ser Asn Asp Pro Ile Arg Val Tyr Gln Gln Phe Ser  
 85 90 95

Thr Ile Asp Ala Leu Ser Asn Gly Arg Ala Glu Ile Met Ala Gly Arg  
 100 105 110

Gly Ser Phe Ile Glu Ser Phe Pro Leu Phe Gly Tyr Asp Leu Ala Asp  
 115 120 125

Tyr Asp Asp Leu Phe Asn Glu Lys Met Asp Met Leu Leu Ala Ile Asn  
 130 135 140

Ser Ala Thr Asn Leu Asp Trp Lys Gly His Leu Thr Gln Thr Val Asn  
 145 150 155 160

Glu Arg Pro Ile Tyr Pro Arg Ala Leu Gln Arg Gln Leu Ser Ile Trp  
 165 170 175

Val Ala Thr Gly Gly Asn Val Asp Ser Thr Ile Arg Ile Ala Glu Gln  
 180 185 190

Gly Leu Pro Ile Val Tyr Ala Thr Ile Gly Gly Asn Pro Lys Ala Phe

195                      200                      205

Arg Gln Leu Val His Ile Tyr Lys Glu Val Gly Lys Ser Val Met Asp  
210                      215                      220

Thr Asn Gln Glu Gln Leu Lys Val Ala Ala His Ser Trp Gly Trp Ile  
225                      230                      235                      240

Glu Glu Asp Asn Gln Thr Ala Ile Asp Arg Tyr Phe Phe Pro Thr Lys  
245                      250                      255

Gln Thr Val Asp Asn Ile Ala Lys Gly Arg Pro His Trp Ser Glu Met  
260                      265                      270

Thr Lys Glu Gln Tyr Leu Arg Ser Ile Gly Pro Glu Gly Ala Ile Phe  
275                      280                      285

Val Gly Asn Pro Glu Val Val Ala His Lys Ile Ile Gly Leu Trp  
290                      295                      300

<210> 89  
<211> 693  
<212> DNA  
<213> Streptococcus agalactiae

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ggagggttaa tgggattggt aggaggttta ttccttggtt taactagtcc tagaggagt 180  
attgctaata aattagtatt tggagtttta gataaagttg tttctgttt tagagctctg 240  
cccttcatta ttcttcttgc tttgattgcg ccagtaactc gcgtaattgt aggaacaaca 300  
cttggttcac cagcagcttt ggtacctctt tctttggcag ttttccatt ttttgctcgt 360  
caagttcaag ttgttttagc tgaacttgat ggtggagtta ttgaggctgc acaagcctca 420  
ggtggaacac tttgggatat tattgtagtt tatcttcgtg aaggtctacc agatttaatt 480  
cgagtatcaa cggttacttt gatttcttta gtaggtgaaa cagctatggc tggcgctatt 540  
ggtgcaggag gattgggttc tggtgctatt actaaaggat ataactattc tcgtgatgat 600  
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gattttttta cacgtcgctt gagtcataaa taa 693

<210> 90  
<211> 230  
<212> PRT  
<213> Streptococcus agalactiae

<400> 90  
Met Ile Glu Trp Ile Gln Thr His Leu Pro Asn Val Tyr Gln Met Gly  
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Trp Glu Gly Ala Tyr Gly Trp Gln Thr Ala Ile Val Gln Thr Leu Tyr  
20                      25                      30

Met Thr Phe Trp Ser Phe Leu Ile Gly Gly Leu Met Gly Leu Leu Gly  
35                      40                      45

Gly Leu Phe Leu Val Leu Thr Ser Pro Arg Gly Val Ile Ala Asn Lys  
 50 55 60  
 Leu Val Phe Gly Val Leu Asp Lys Val Val Ser Val Phe Arg Ala Leu  
 65 70 75 80  
 Pro Phe Ile Ile Leu Leu Ala Leu Ile Ala Pro Val Thr Arg Val Ile  
 85 90 95  
 Val Gly Thr Thr Leu Gly Ser Pro Ala Ala Leu Val Pro Leu Ser Leu  
 100 105 110  
 Ala Val Phe Pro Phe Phe Ala Arg Gln Val Gln Val Val Leu Ala Glu  
 115 120 125  
 Leu Asp Gly Gly Val Ile Glu Ala Ala Gln Ala Ser Gly Gly Thr Leu  
 130 135 140  
 Trp Asp Ile Ile Val Val Tyr Leu Arg Glu Gly Leu Pro Asp Leu Ile  
 145 150 155 160  
 Arg Val Ser Thr Val Thr Leu Ile Ser Leu Val Gly Glu Thr Ala Met  
 165 170 175  
 Ala Gly Ala Ile Gly Ala Gly Gly Leu Gly Ser Val Ala Ile Thr Lys  
 180 185 190  
 Gly Tyr Asn Tyr Ser Arg Asp Asp Ile Thr Leu Val Ala Thr Ile Leu  
 195 200 205  
 Ile Leu Leu Leu Ile Phe Phe Ile Gln Phe Leu Gly Asp Phe Leu Thr  
 210 215 220  
 Arg Arg Leu Ser His Lys  
 225 230

<210> 91

<211> 759

<212> DNA

<213> Streptococcus agalactiae

<400> 91

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 gtctatgggt cttggatttt tctgtttttt attaagttaa cacaaagtgt accaactttg 180  
 acccacaact cactcctcgc agcacttttt ggaggtgta ttgtaggatg tggtttgggg 240  
 attgtttttt ggagcgactc ttcaactggt ggaacgggga ttatcattca attcttagga 300  
 aaatatactc ctataagcct tggacaaggg gttatattga ttgatggact tgttacaatt 360  
 gttgggtttcc tagcttttga cagtgtatgc gttatgtttt ctattattgg gttgataact 420  
 attagttata ttattaatgc tatccaaact ggatttaciaa ccttaagcac tgtcttaact 480  
 gtttctcaag agcaccaaaa aattaagaca tatatcaata ctgtcgcaga tagaggagta 540  
 acagaaattc ccgttaaagg gggatattct ggaactaatc aaatcatgct tatgacaact 600  
 attgctgggt atgagtttgc taaattacaa gaggcaatag cagaaattga cgaaacagcc 660  
 ttcataacag taactccaac atcacaagct tctggacgtg gatttagtct tcaaaaaaat 720  
 catggacgtc ttgatgaaga cattcttatg ccaatgtaa 759

<210> 92  
 <211> 252  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 92

Met	Ala	Val	Ser	Phe	His	Glu	Val	Phe	Gly	Trp	Asp	Ser	Ala	Phe	Phe
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Ile	Met	Ile	Ile	Asn	Ile	Pro	Leu	Leu	Leu	Leu	Cys	Tyr	Phe	Gly	Leu
			20				25						30		
Gly	Lys	Gln	Thr	Phe	Leu	Lys	Thr	Val	Tyr	Gly	Ser	Trp	Ile	Phe	Pro
		35					40					45			
Val	Phe	Ile	Lys	Leu	Thr	Gln	Ser	Val	Pro	Thr	Leu	Thr	His	Asn	Ser
	50					55					60				
Leu	Leu	Ala	Ala	Leu	Phe	Gly	Gly	Val	Ile	Val	Gly	Cys	Gly	Leu	Gly
65				70						75				80	
Ile	Val	Phe	Trp	Ser	Asp	Ser	Ser	Thr	Gly	Gly	Thr	Gly	Ile	Ile	Ile
			85						90				95		
Gln	Phe	Leu	Gly	Lys	Tyr	Thr	Pro	Ile	Ser	Leu	Gly	Gln	Gly	Val	Ile
		100						105					110		
Leu	Ile	Asp	Gly	Leu	Val	Thr	Ile	Val	Gly	Phe	Leu	Ala	Phe	Asp	Ser
		115					120					125			
Asp	Thr	Val	Met	Phe	Ser	Ile	Ile	Gly	Leu	Ile	Thr	Ile	Ser	Tyr	Ile
	130					135					140				
Ile	Asn	Ala	Ile	Gln	Thr	Gly	Phe	Thr	Thr	Leu	Ser	Thr	Val	Leu	Ile
145				150						155				160	
Val	Ser	Gln	Glu	His	Gln	Lys	Ile	Lys	Thr	Tyr	Ile	Asn	Thr	Val	Ala
			165					170						175	
Asp	Arg	Gly	Val	Thr	Glu	Ile	Pro	Val	Lys	Gly	Gly	Tyr	Ser	Gly	Thr
		180						185					190		
Asn	Gln	Ile	Met	Leu	Met	Thr	Thr	Ile	Ala	Gly	Tyr	Glu	Phe	Ala	Lys
		195					200					205			
Leu	Gln	Glu	Ala	Ile	Ala	Glu	Ile	Asp	Glu	Thr	Ala	Phe	Ile	Thr	Val
	210					215					220				
Thr	Pro	Thr	Ser	Gln	Ala	Ser	Gly	Arg	Gly	Phe	Ser	Leu	Gln	Lys	Asn
225				230						235				240	
His	Gly	Arg	Leu	Asp	Glu	Asp	Ile	Leu	Met	Pro	Met				
			245					250							

<210> 93  
 <211> 549  
 <212> DNA  
 <213> Streptococcus agalactiae

<400> 93  
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 gttattctaa gtccaaatag tcaagccatt ttaacaggaa cgattccagc ttttgaggaa 180  
 aaatacggta taaaagttaa gcttattcaa ggtgggacag ggcaactaat agatagatta 240  
 agtaaggagg gtaagcagtt gaaggcggat attttctttg gaggaatta tacgcaattt 300  
 gaaagtcata aggcattgtt tgagtcttac gtatcaaaga atgttcatac tgttattcca 360  
 gactatatcc atccgagtga tacggcgaca ccttatacta taaatgggag tgtcttgatt 420  
 gtaaataacg aattagctaa gggacttacc atcaagagtt atgaagattt attacagcct 480  
 tccttaaaag gtaaaattgc ctttgcagat cctctagagt cgacctgcaa gcatgcaagc 540  
 ttggcgtaa 549

<210> 94  
 <211> 182  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 94  
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 Lys Leu Leu Pro Pro Lys Glu Leu Val Ile Leu Ser Pro Asn Ser Gln  
 35 40 45  
 Ala Ile Leu Thr Gly Thr Ile Pro Ala Phe Glu Glu Lys Tyr Gly Ile  
 50 55 60  
 Lys Val Lys Leu Ile Gln Gly Gly Thr Gly Gln Leu Ile Asp Arg Leu  
 65 70 75 80  
 Ser Lys Glu Gly Lys Gln Leu Lys Ala Asp Ile Phe Phe Gly Gly Asn  
 85 90 95  
 Tyr Thr Gln Phe Glu Ser His Lys Ala Leu Phe Glu Ser Tyr Val Ser  
 100 105 110  
 Lys Asn Val His Thr Val Ile Pro Asp Tyr Ile His Pro Ser Asp Thr  
 115 120 125  
 Ala Thr Pro Tyr Thr Ile Asn Gly Ser Val Leu Ile Val Asn Asn Glu  
 130 135 140  
 Leu Ala Lys Gly Leu Thr Ile Lys Ser Tyr Glu Asp Leu Leu Gln Pro  
 145 150 155 160  
 Ser Leu Lys Gly Lys Ile Ala Phe Ala Asp Pro Leu Glu Ser Thr Cys  
 165 170 175

Lys His Ala Ser Leu Ala  
180

<210> 95  
<211> 368  
<212> DNA  
<213> Streptococcus agalactiae

<400> 95  
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tacatatcca gccgccaaaa caaaccacca cgcttttgaa tcaggattgg catatcacac 180  
ggcaacaatg gttcgttttg cagatagtat cggagatatc tatccagaac ttaataaaaag 240  
tttgatgttt gctggtatta tgctacatga tttagccaag gtcatagagt tatcgggtcc 300  
tgataataca gaatatacta ttcgaggtaa tcttatcggg catatttcac ttattgatga 360  
ggaattaa 368

<210> 96  
<211> 122  
<212> PRT  
<213> Streptococcus agalactiae

<400> 96  
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20 25 30  
Arg Lys Tyr Asn Lys Glu Phe Phe Thr Tyr Pro Ala Ala Lys Thr Asn  
35 40 45  
His His Ala Phe Glu Ser Gly Leu Ala Tyr His Thr Ala Thr Met Val  
50 55 60  
Arg Leu Ala Asp Ser Ile Gly Asp Ile Tyr Pro Glu Leu Asn Lys Ser  
65 70 75 80  
Leu Met Phe Ala Gly Ile Met Leu His Asp Leu Ala Lys Val Ile Glu  
85 90 95  
Leu Ser Gly Pro Asp Asn Thr Glu Tyr Thr Ile Arg Gly Asn Leu Ile  
100 105 110  
Gly His Ile Ser Leu Ile Asp Glu Glu Leu  
115 120

<210> 97  
<211> 753  
<212> DNA  
<213> Streptococcus agalactiae

<400> 97

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aatgaggata taaaaaagac atcctctcaa aaaagaaata agaaattacg attaccagct 180
gtatcatcaa aagattggaa cttgattttg gtcaatcgtg accataaaca tgaagaatta 240
agtccagatg tgggtgctgt tgaaaatatt tatttgata aacgtattac gaagcaagct 300
actcagtttt tagaggctgc tagagcaatt gattcacgag aacatttaac ttcgggttat 360
cgtagtggtg cctatcagga gaagttgttc aattcttatg ttactcaaga gatgactagt 420
aaccctaatt tgacgagggg acaagcagaa aagttggtaa aaacttactc tcagcctgca 480
ggtgctagtg aacaccagac tggattagcg atggatatga gtactgtaga ttctttgaat 540
gagagcgatc ctagagtagt cagtcagttg aaaaagatag ctccacaata tggttttgtc 600
ttacggtttc cggatggtaa aacagcagaa acaggggtag gttatgaaga ttggcattac 660
cgctatgttg gggtagagtc tgcaaaatat atggtcaaac atcatttaac attagaagaa 720
tacataactt tattaagga gaataaccaa tga 753
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<210> 98

<211> 250

<212> PRT

<213> Streptococcus agalactiae

<400> 98

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  1             5             10             15

Ala Ile Leu Cys Phe Ser Leu Phe Ala Leu Leu Lys Pro Asn Ser Gln
      20             25             30

Gln Ser Ser Ser Gln Lys Leu Arg Asn Glu Asp Ile Lys Lys Thr Ser
      35             40             45

Ser Gln Lys Arg Asn Lys Lys Leu Arg Leu Pro Ala Val Ser Ser Lys
      50             55             60

Asp Trp Asn Leu Ile Leu Val Asn Arg Asp His Lys His Glu Glu Leu
      65             70             75             80

Ser Pro Asp Val Val Pro Val Glu Asn Ile Tyr Leu Asp Lys Arg Ile
      85             90             95

Thr Lys Gln Ala Thr Gln Phe Leu Glu Ala Ala Arg Ala Ile Asp Ser
      100            105            110

Arg Glu His Leu Ile Ser Gly Tyr Arg Ser Val Ala Tyr Gln Glu Lys
      115            120            125

Leu Phe Asn Ser Tyr Val Thr Gln Glu Met Thr Ser Asn Pro Asn Leu
      130            135            140

Thr Arg Gly Gln Ala Glu Lys Leu Val Lys Thr Tyr Ser Gln Pro Ala
      145            150            155            160

Gly Ala Ser Glu His Gln Thr Gly Leu Ala Met Asp Met Ser Thr Val
      165            170            175

Asp Ser Leu Asn Glu Ser Asp Pro Arg Val Val Ser Gln Leu Lys Lys
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180 185 190

Ile Ala Pro Gln Tyr Gly Phe Val Leu Arg Phe Pro Asp Gly Lys Thr  
195 200 205

Ala Glu Thr Gly Val Gly Tyr Glu Asp Trp His Tyr Arg Tyr Val Gly  
210 215 220

Val Glu Ser Ala Lys Tyr Met Val Lys His His Leu Thr Leu Glu Glu  
225 230 235 240

Tyr Ile Thr Leu Leu Lys Glu Asn Asn Gln  
245 250

<210> 99  
<211> 351  
<212> DNA  
<213> Streptococcus agalactiae

<400> 99  
ctgttatgtg gatttcttcc atcaattcct gtgtctaatt ccgggggggta tgggtataata 60  
acagttatga aaaataaaaa aatcttattt gggactggcc ttgctgggtg gggtttactg 120  
gcagctgctg gttataccct aactaaaaaa gtaacagatt ataaacgtca gcaaatcact 180  
cagaccttaa gagaactttt tagtcagatg ggtgatattc aggtatttta ttttaataa 240  
tttgaatctg atattaaaat gaccagtggg ggtcttgtct tggaagatgg cagaattttc 300  
gaattcattt atcgtcaagg tgttcttgat tatgtggagg tgagcaaatg a 351

<210> 100  
<211> 116  
<212> PRT  
<213> Streptococcus agalactiae

<400> 100  
Leu Leu Cys Gly Phe Leu Pro Ser Ile Pro Val Ser Asn Ser Gly Gly  
1 5 10 15

Tyr Gly Ile Ile Thr Val Met Lys Asn Lys Lys Ile Leu Phe Gly Thr  
20 25 30

Gly Leu Ala Gly Val Gly Leu Leu Ala Ala Ala Gly Tyr Thr Leu Thr  
35 40 45

Lys Lys Val Thr Asp Tyr Lys Arg Gln Gln Ile Thr Gln Thr Leu Arg  
50 55 60

Glu Leu Phe Ser Gln Met Gly Asp Ile Gln Val Phe Tyr Phe Asn Glu  
65 70 75 80

Phe Glu Ser Asp Ile Lys Met Thr Ser Gly Gly Leu Val Leu Glu Asp  
85 90 95

Gly Arg Ile Phe Glu Phe Ile Tyr Arg Gln Gly Val Leu Asp Tyr Val  
100 105 110

Glu Val Ser Lys  
115

<210> 101  
<211> 310  
<212> DNA  
<213> Streptococcus agalactiae

<400> 101  
atgtatcaaaa ctcagacaaa taaggaaaaa tttgttttat ttttgaaatt atttatccca 60  
gtattgattt atcaatttgc taatttttca gctactttta ttgattcggg tatgactgga 120  
cagtatagtc agctacattt ggcagggtgtg tcaactgcta gtaatttatg gactccgttt 180  
ttcgctttat tagtaggtat gatttcagca ttagtaccag tagttgggtca acatttgggt 240  
agaggaaata aagaacaaat tcgcacagaa tttcatcaat ttctatatatt aggtttgata 300  
ctgtccttaa 310

<210> 102  
<211> 103  
<212> PRT  
<213> Streptococcus agalactiae

<400> 102  
Met Tyr Gln Thr Gln Thr Asn Lys Glu Lys Phe Val Leu Phe Leu Lys  
1 5 10 15  
Leu Phe Ile Pro Val Leu Ile Tyr Gln Phe Ala Asn Phe Ser Ala Thr  
20 25 30  
Phe Ile Asp Ser Val Met Thr Gly Gln Tyr Ser Gln Leu His Leu Ala  
35 40 45  
Gly Val Ser Thr Ala Ser Asn Leu Trp Thr Pro Phe Phe Ala Leu Leu  
50 55 60  
Val Gly Met Ile Ser Ala Leu Val Pro Val Val Gly Gln His Leu Gly  
65 70 75 80  
Arg Gly Asn Lys Glu Gln Ile Arg Thr Glu Phe His Gln Phe Leu Tyr  
85 90 95  
Leu Gly Leu Ile Leu Ser Leu  
100

<210> 103  
<211> 1098  
<212> DNA  
<213> Streptococcus agalactiae

<400> 103  
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atggagaaga tgatgcaaga tgttttcatt ataggaagta gagggttgcc agctcggttac 120  
ggtgggtttt aaacttttgt ttcagaattg attaatcatc aaaaaagttc cgacataaaa 180

taccatgttg catgccttag tgataaagaa catcatactc attttaactt tgctgacgct 240  
gattgtttta ctataaatcc tccccaatta gggccagcac gtgtgattgc ttatgatatt 300  
atggccatta attatgccct tgacttgggt aagacacatg atttaaaaga gcctatTTTT 360  
tatatttttag gaaatacaat tggtgccttt atttggcatt ttgccaataa aatacataaa 420  
gtcgggtggct tattgtatgt taatccggat ggtttagagt ggaagcgatc aaagtggctc 480  
cgtcccacac agcgttatTTT aaaatacgcc gaaaaatgta tgactaaaaa tgcagaccta 540  
attattttctg ataattattgg tattgaaaat tacattcaat ctacctactc taatgtgaag 600  
acaaggttca ttgcttacgg tacagagatt aattctagga aattatcgtc agatgatcca 660  
cgtgtcaaac agttgtttaa aaaatggaat attaagtcta agggttacta tctaactggt 720  
ggtcgatttg tccctgaaaa caattatgaa acggctatta gggagttcat ggcttcagat 780  
actaagcgtg atttagttat tatctgtaac catcaaaata acccctactt tgaaaagtgtg 840  
tccttaaaga caaaccttca acaagataaa agagttaagt ttgtaggtac gctctatgaa 900  
aaagatctgc tggattatgt tctgcaacaa gcctttgctt atattcatgg gcatgaagtt 960  
ggcgggtacta atccaggact gcttgaggct ttagctaata ctgatttgaa tcttgttcta 1020  
gatgttgatt tcaacaaatc agtagcaggt ctctcaagtt tttactggac taaaaaagag 1080  
ggggatttag ctaagctt 1098

<210> 104

<211> 366

<212> PRT

<213> Streptococcus agalactiae

<400> 104

Met Leu Phe Leu Ala Asn Phe Ser Asn Leu Trp Tyr Asn Cys Met Asp  
1 5 10 15  
Cys Leu Ala Arg Met Glu Lys Met Met Gln Asp Val Phe Ile Ile Gly  
20 25 30  
Ser Arg Gly Leu Pro Ala Arg Tyr Gly Gly Phe Glu Thr Phe Val Ser  
35 40 45  
Glu Leu Ile Asn His Gln Lys Ser Ser Asp Ile Lys Tyr His Val Ala  
50 55 60  
Cys Leu Ser Asp Lys Glu His His Thr His Phe Asn Phe Ala Asp Ala  
65 70 75 80  
Asp Cys Phe Thr Ile Asn Pro Pro Gln Leu Gly Pro Ala Arg Val Ile  
85 90 95  
Ala Tyr Asp Ile Met Ala Ile Asn Tyr Ala Leu Asp Leu Val Lys Thr  
100 105 110  
His Asp Leu Lys Glu Pro Ile Phe Tyr Ile Leu Gly Asn Thr Ile Gly  
115 120 125  
Ala Phe Ile Trp His Phe Ala Asn Lys Ile His Lys Val Gly Gly Leu  
130 135 140  
Leu Tyr Val Asn Pro Asp Gly Leu Glu Trp Lys Arg Ser Lys Trp Ser  
145 150 155 160  
Arg Pro Thr Gln Arg Tyr Leu Lys Tyr Ala Glu Lys Cys Met Thr Lys  
165 170 175

Asn Ala Asp Leu Ile Ile Ser Asp Asn Ile Gly Ile Glu Asn Tyr Ile  
 180 185 190  
 Gln Ser Thr Tyr Ser Asn Val Lys Thr Arg Phe Ile Ala Tyr Gly Thr  
 195 200 205  
 Glu Ile Asn Ser Arg Lys Leu Ser Ser Asp Asp Pro Arg Val Lys Gln  
 210 215 220  
 Leu Phe Lys Lys Trp Asn Ile Lys Ser Lys Gly Tyr Tyr Leu Ile Val  
 225 230 235 240  
 Gly Arg Phe Val Pro Glu Asn Asn Tyr Glu Thr Ala Ile Arg Glu Phe  
 245 250 255  
 Met Ala Ser Asp Thr Lys Arg Asp Leu Val Ile Ile Cys Asn His Gln  
 260 265 270  
 Asn Asn Pro Tyr Phe Glu Lys Leu Ser Leu Lys Thr Asn Leu Gln Gln  
 275 280 285  
 Asp Lys Arg Val Lys Phe Val Gly Thr Leu Tyr Glu Lys Asp Leu Leu  
 290 295 300  
 Asp Tyr Val Arg Gln Gln Ala Phe Ala Tyr Ile His Gly His Glu Val  
 305 310 315 320  
 Gly Gly Thr Asn Pro Gly Leu Leu Glu Ala Leu Ala Asn Thr Asp Leu  
 325 330 335  
 Asn Leu Val Leu Asp Val Asp Phe Asn Lys Ser Val Ala Gly Leu Ser  
 340 345 350  
 Ser Phe Tyr Trp Thr Lys Lys Glu Gly Asp Leu Ala Lys Leu  
 355 360 365

<210> 105

<211> 546

<212> DNA

<213> Streptococcus agalactiae

<400> 105

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 atatctgaac aacttgattc aattcgccaa cagacattaa aaccagatta tgtattattg 120  
 agggatgatt gttcaacgga tgaaacagtc aatgtcgtca ataactatat cgcaaaacat 180  
 gagttagaag gctggaaaat tgtaaaaaac gacaaaaact taggctggcg tttaaatttt 240  
 cgtcaattac ttattgatgt gttagcctat gaggttgact atgtcttttt tagtgatcaa 300  
 gatgatattt ggtatcttga taaaaacgaa cgacagtttg ccattatgtc agataaccct 360  
 caaattgagg ttttgagtgc agacgttgat atcaaaacga tgtctacaga agccagtgtt 420  
 ccacattttc taactttttc ttctagtgat agaatcagtc agtatcctaa agtatatgat 480  
 tatcaaacat tccgtcccgg atggaccatt gctatgaaga gagattttgc gcaagctatc 546  
 gcttga

<210> 106

<211> 181  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 106  
 Met Arg Ser Asn Met Val Lys Thr Ala Val Leu Met Ala Thr Tyr Asn  
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 Gly Glu Lys Phe Ile Ser Glu Gln Leu Asp Ser Ile Arg Gln Gln Thr  
 20 25 30  
 Leu Lys Pro Asp Tyr Val Leu Leu Arg Asp Asp Cys Ser Thr Asp Glu  
 35 40 45  
 Thr Val Asn Val Val Asn Asn Tyr Ile Ala Lys His Glu Leu Glu Gly  
 50 55 60  
 Trp Lys Ile Val Lys Asn Asp Lys Asn Leu Gly Trp Arg Leu Asn Phe  
 65 70 75 80  
 Arg Gln Leu Leu Ile Asp Val Leu Ala Tyr Glu Val Asp Tyr Val Phe  
 85 90 95  
 Phe Ser Asp Gln Asp Asp Ile Trp Tyr Leu Asp Lys Asn Glu Arg Gln  
 100 105 110  
 Phe Ala Ile Met Ser Asp Asn Pro Gln Ile Glu Val Leu Ser Ala Asp  
 115 120 125  
 Val Asp Ile Lys Thr Met Ser Thr Glu Ala Ser Val Pro His Phe Leu  
 130 135 140  
 Thr Phe Ser Ser Ser Asp Arg Ile Ser Gln Tyr Pro Lys Val Tyr Asp  
 145 150 155 160  
 Tyr Gln Thr Phe Arg Pro Gly Trp Thr Ile Ala Met Lys Arg Asp Phe  
 165 170 175  
 Ala Gln Ala Ile Ala  
 180

<210> 107  
 <211> 639  
 <212> DNA  
 <213> Streptococcus agalactiae

<400> 107  
 gtgattatgg ataagtctat tcctaaagca actgctaaac gtttatcact gtactaccgt 60  
 atttttaaac gttttaatac tgatggcatc gaaaaagcta gttccaaaca aattgcagat 120  
 gccctaggtta tcgattctgc tactgttcga cgtgattttt cttatttttg tgaactagga 180  
 cgccgtgggtt ttggttatga tgtcaaaaaa cttatgaact tctttgcaga aatattgaac 240  
 gatcattcta caacaaatgt tatgctgggtg ggggtgtggaa atatcggtag agctctcttg 300  
 cattatcggtt tccacgatcg caataaaatg caaatttcaa tggcttttga tttagatagc 360  
 aatgatttag ttggtaaaac aaccgaggat ggaattcctg tctacggtat ttcgactatc 420  
 aatgaccatt taatagatag tgatattgaa actgctatcc taacagtacc tagtacagaa 480

gcccaagaag ttgctgacat cttagtcaaa gcaggtataa aaggcatctt gagtttttct 540  
ccagttcatt taacattacc aaaagatatac attgttcagt atgtagattt aacaagcgaa 600  
ttacaaactt tactttattt catgaaccag cagcgataa 639

<210> 108

<211> 212

<212> PRT

<213> Streptococcus agalactiae

<400> 108

Met	Ile	Met	Asp	Lys	Ser	Ile	Pro	Lys	Ala	Thr	Ala	Lys	Arg	Leu	Ser	1	5	10	15
Leu	Tyr	Tyr	Arg	Ile	Phe	Lys	Arg	Phe	Asn	Thr	Asp	Gly	Ile	Glu	Lys	20	25	30	
Ala	Ser	Ser	Lys	Gln	Ile	Ala	Asp	Ala	Leu	Gly	Ile	Asp	Ser	Ala	Thr	35	40	45	
Val	Arg	Arg	Asp	Phe	Ser	Tyr	Phe	Gly	Glu	Leu	Gly	Arg	Arg	Gly	Phe	50	55	60	
Gly	Tyr	Asp	Val	Lys	Lys	Leu	Met	Asn	Phe	Phe	Ala	Glu	Ile	Leu	Asn	65	70	75	80
Asp	His	Ser	Thr	Thr	Asn	Val	Met	Leu	Val	Gly	Cys	Gly	Asn	Ile	Gly	85	90	95	
Arg	Ala	Leu	Leu	His	Tyr	Arg	Phe	His	Asp	Arg	Asn	Lys	Met	Gln	Ile	100	105	110	
Ser	Met	Ala	Phe	Asp	Leu	Asp	Ser	Asn	Asp	Leu	Val	Gly	Lys	Thr	Thr	115	120	125	
Glu	Asp	Gly	Ile	Pro	Val	Tyr	Gly	Ile	Ser	Thr	Ile	Asn	Asp	His	Leu	130	135	140	
Ile	Asp	Ser	Asp	Ile	Glu	Thr	Ala	Ile	Leu	Thr	Val	Pro	Ser	Thr	Glu	145	150	155	160
Ala	Gln	Glu	Val	Ala	Asp	Ile	Leu	Val	Lys	Ala	Gly	Ile	Lys	Gly	Ile	165	170	175	
Leu	Ser	Phe	Ser	Pro	Val	His	Leu	Thr	Leu	Pro	Lys	Asp	Ile	Ile	Val	180	185	190	
Gln	Tyr	Val	Asp	Leu	Thr	Ser	Glu	Leu	Gln	Thr	Leu	Leu	Tyr	Phe	Met	195	200	205	
Asn	Gln	Gln	Arg	210															

<210> 109

<211> 476

<212> DNA

<213> Streptococcus agalactiae

<400> 109

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atgggtgcta aaggagcaga tgtcattctc gttttatcac actctggcat tggagatgat 60
cgatatgaag aaggtgaaga aaacgttggc tatcaaattg ccagcatcaa gggagtggat 120
gccgttggtta cgggacactc acacgctgaa tttccatcag gtaacggtac tggcttctat 180
gaaaaataca ctggagttga tggatatcaat ggaaaaataa atggaacacc tgttacaatg 240
gcaggcaagt acggggatca ccttggtatt attgatttag gacttagtta tactaatgga 300
aaatggcaag tctccgaaag cagtgcataa atccgtaaaa ttgatatgaa ctcaacaact 360
gctgacgagc gtatcattgc attggctaag gaagcacacg atggcactat caactatggt 420
cgccaacaag taggtacaac aactgcgcca attacaagtt actttgcact agttaa 476
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<210> 110

<211> 158

<212> PRT

<213> Streptococcus agalactiae

<400> 110

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Met Gly Ala Lys Gly Ala Asp Val Ile Leu Val Leu Ser His Ser Gly
 1             5             10             15

Ile Gly Asp Asp Arg Tyr Glu Glu Gly Glu Glu Asn Val Gly Tyr Gln
      20             25             30

Ile Ala Ser Ile Lys Gly Val Asp Ala Val Val Thr Gly His Ser His
      35             40             45

Ala Glu Phe Pro Ser Gly Asn Gly Thr Gly Phe Tyr Glu Lys Tyr Thr
      50             55             60

Gly Val Asp Gly Ile Asn Gly Lys Ile Asn Gly Thr Pro Val Thr Met
      65             70             75             80

Ala Gly Lys Tyr Gly Asp His Leu Gly Ile Ile Asp Leu Gly Leu Ser
      85             90             95

Tyr Thr Asn Gly Lys Trp Gln Val Ser Glu Ser Ser Ala Lys Ile Arg
      100            105            110

Lys Ile Asp Met Asn Ser Thr Thr Ala Asp Glu Arg Ile Ile Ala Leu
      115            120            125

Ala Lys Glu Ala His Asp Gly Thr Ile Asn Tyr Val Arg Gln Gln Val
      130            135            140

Gly Thr Thr Thr Ala Pro Ile Thr Ser Tyr Phe Ala Leu Val
      145            150            155
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<210> 111

<211> 170

<212> DNA

<213> Streptococcus agalactiae

<400> 111  
 ttgtcaataa ggtttcaa at cagcttgaaa tatgataaaa taaaacagat tgtaagtga 60  
 tgtttaagct tgtttttcag agaggttttt atgaatacaa acacaataaa aaaggttgta 120  
 gcgactggaa ttggagctgc actttttatc attataggta tgctagttaa 170

<210> 112  
 <211> 56  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 112  
 Met Ser Ile Arg Phe Gln Ile Ser Leu Lys Tyr Asp Lys Ile Lys Gln  
 1 5 10 15  
 Ile Val Ser Asp Cys Leu Ser Leu Phe Phe Arg Glu Val Phe Met Asn  
 20 25 30  
 Thr Asn Thr Ile Lys Lys Val Val Ala Thr Gly Ile Gly Ala Ala Leu  
 35 40 45  
 Phe Ile Ile Ile Gly Met Leu Val  
 50 55

<210> 113  
 <211> 242  
 <212> DNA  
 <213> Streptococcus agalactiae

<400> 113  
 atgaaacatt taaaatttca atcggtcttc gacattattg gtctgttat gattggacca 60  
 tcaagtagtc atactgcagg agctgtccgc attggttaaag ttgtccattc tttttttggt 120  
 gaacctagtg aagtaacctt tcatttatac aattcttttg ctaaaactta ccaaggacac 180  
 ggtactgata aagcattggt tgcagggatt ctaggaatgg atacagataa tccagatatt 240  
 aa 242

<210> 114  
 <211> 80  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 114  
 Met Lys His Leu Lys Phe Gln Ser Val Phe Asp Ile Ile Gly Pro Val  
 1 5 10 15  
 Met Ile Gly Pro Ser Ser Ser His Thr Ala Gly Ala Val Arg Ile Gly  
 20 25 30  
 Lys Val Val His Ser Ile Phe Gly Glu Pro Ser Glu Val Thr Phe His  
 35 40 45  
 Leu Tyr Asn Ser Phe Ala Lys Thr Tyr Gln Gly His Gly Thr Asp Lys  
 50 55 60



Ala Leu Val Ala Gly Ile Leu Gly Met Asp Thr Asp Asn Pro Asp Ile  
65 70 75 80

<210> 115  
<211> 122  
<212> DNA  
<213> Streptococcus agalactiae

<400> 115  
gtgtcagaag gtgttttaaat gtttctaaaa gaagatgacg tagagacttt ttttcatatc 60  
ctgacaaatt catttagcca atttatggca caatttgatt tgtgtcataa ggaaatgatt 120  
aa 122

<210> 116  
<211> 83  
<212> DNA  
<213> Streptococcus agalactiae

<400> 116  
atgacctaca aagattacac aggttttagat cggactgaac ttttgagtaa agtgcgcat 60  
atgatgtccg acaaacgttt taa 83

<210> 117  
<211> 27  
<212> PRT  
<213> Streptococcus agalactiae

<400> 117  
Met Thr Tyr Lys Asp Tyr Thr Gly Leu Asp Arg Thr Glu Leu Leu Ser  
1 5 10 15

Lys Val Arg His Met Met Ser Asp Lys Arg Phe  
20 25

<210> 118  
<211> 94  
<212> DNA  
<213> Streptococcus agalactiae

<400> 118  
ctgagttggg tcttggaac ggtcctgtca atcatactag ctatcaagga gactaaaatg 60  
tatttagaac aactaaaaga ggtaaactct ttaa 94

<210> 119  
<211> 31  
<212> PRT  
<213> Streptococcus agalactiae

<400> 119

Met Ser Trp Val Leu Glu Thr Val Leu Ser Ile Ile Leu Ala Ile Lys  
1 5 10 15

Glu Thr Lys Met Tyr Leu Glu Gln Leu Lys Glu Val Asn Pro Leu  
20 25 30

<210> 120

<211> 1230

<212> DNA

<213> Streptococcus agalactiae

<400> 120

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gctggtggag catttgctag ttttgtcatg aatcataatg acaatattcc aaatggtggt 120  
gtcactaaaa ctagtaaaagt aaattataat aacataacgc ctacaacaaa agctgttaaa 180  
aaggtacaaa atagtgttgt ttctgttatc aattataaac aacaagagag tcgttctgac 240  
ctatcagact tctatagtca tttttttggt aatcaggggg gcaacactga taagggctta 300  
caagtttacg gtgaaggctc tggagtcac tataaaaaag atggtaaaaa tgcctatggt 360  
gtcactaata accacgtcat tgatggggct aaacaaattg aaattcaact agctgatggc 420  
tcaaaagcag ttgggaaact tgttgggtca gatacctact ctgatttagc cgtcgtcaaa 480  
attccatcag ataaaagtttc aaatattgca gaatttgctg attcatcaaa actcaacatt 540  
ggtgaaactg ctatagcgat cggaagccct cttggaactg agtatgcaaa ttctgtaact 600  
caaggtattg tatctagttt aaaaagaact gtaacaatga ctaatgaaga aggacaaaca 660  
gtttctacaa atgctatcca gacggatgct gctatcaatc ctggtaattc aggtggagca 720  
cttatcaata ttgaaggaca gggtattgga attaatctta gtaaaatttc ttctacatca 780  
aatcaaactc caggacaatc gtcaggaaat agcgttgaag gtatgggatt tgccattcct 840  
tcaaatgatg ttgttaagat tatcaatcaa ctgagagta acggacaagt agagagacct 900  
gctctaggta tttctatggc tggattaagt aatttaccat ccgatgttat tagtaaaactg 960  
aaaatcccaa gtaatgttac taatggtatt gtagtagcat ctatccaatc tggcatgcca 1020  
gctcaaggca aactaaagaa atacgatgtc attactaaag ttgacgataa agaagtagca 1080  
tctccaagtg atttacaaaag tttactctat ggccaccagg taggggattc cataacagta 1140  
accttttatc gtggtgaaaa taaacaaaca gtcactataa aacttactaa aactagtaaa 1200  
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<210> 121

<211> 409

<212> PRT

<213> Streptococcus agalactiae

<400> 121

Met Lys Lys Lys Leu Val Ser Ser Leu Leu Lys Cys Ser Leu Ile Ile  
1 5 10 15

Ile Val Ser Phe Ala Gly Gly Ala Phe Ala Ser Phe Val Met Asn His  
20 25 30

Asn Asp Asn Ile Pro Asn Gly Gly Val Thr Lys Thr Ser Lys Val Asn  
35 40 45

Tyr Asn Asn Ile Thr Pro Thr Thr Lys Ala Val Lys Lys Val Gln Asn  
50 55 60

Ser Val Val Ser Val Ile Asn Tyr Lys Gln Gln Glu Ser Arg Ser Asp  
 65 70 75 80  
 Leu Ser Asp Phe Tyr Ser His Phe Phe Gly Asn Gln Gly Gly Asn Thr  
 85 90 95  
 Asp Lys Gly Leu Gln Val Tyr Gly Glu Gly Ser Gly Val Ile Tyr Lys  
 100 105 110  
 Lys Asp Gly Lys Asn Ala Tyr Val Val Thr Asn Asn His Val Ile Asp  
 115 120 125  
 Gly Ala Lys Gln Ile Glu Ile Gln Leu Ala Asp Gly Ser Lys Ala Val  
 130 135 140  
 Gly Lys Leu Val Gly Ser Asp Thr Tyr Ser Asp Leu Ala Val Val Lys  
 145 150 155 160  
 Ile Pro Ser Asp Lys Val Ser Asn Ile Ala Glu Phe Ala Asp Ser Ser  
 165 170 175  
 Lys Leu Asn Ile Gly Glu Thr Ala Ile Ala Ile Gly Ser Pro Leu Gly  
 180 185 190  
 Thr Glu Tyr Ala Asn Ser Val Thr Gln Gly Ile Val Ser Ser Leu Lys  
 195 200 205  
 Arg Thr Val Thr Met Thr Asn Glu Glu Gly Gln Thr Val Ser Thr Asn  
 210 215 220  
 Ala Ile Gln Thr Asp Ala Ala Ile Asn Pro Gly Asn Ser Gly Gly Ala  
 225 230 235 240  
 Leu Ile Asn Ile Glu Gly Gln Val Ile Gly Ile Asn Ser Ser Lys Ile  
 245 250 255  
 Ser Ser Thr Ser Asn Gln Thr Ser Gly Gln Ser Ser Gly Asn Ser Val  
 260 265 270  
 Glu Gly Met Gly Phe Ala Ile Pro Ser Asn Asp Val Val Lys Ile Ile  
 275 280 285  
 Asn Gln Leu Glu Ser Asn Gly Gln Val Glu Arg Pro Ala Leu Gly Ile  
 290 295 300  
 Ser Met Ala Gly Leu Ser Asn Leu Pro Ser Asp Val Ile Ser Lys Leu  
 305 310 315 320  
 Lys Ile Pro Ser Asn Val Thr Asn Gly Ile Val Val Ala Ser Ile Gln  
 325 330 335  
 Ser Gly Met Pro Ala Gln Gly Lys Leu Lys Lys Tyr Asp Val Ile Thr  
 340 345 350  
 Lys Val Asp Asp Lys Glu Val Ala Ser Pro Ser Asp Leu Gln Ser Leu  
 355 360 365

Leu Tyr Gly His Gln Val Gly Asp Ser Ile Thr Val Thr Phe Tyr Arg  
 370 375 380

Gly Glu Asn Lys Gln Thr Val Thr Ile Lys Leu Thr Lys Thr Ser Lys  
 385 390 395 400

Asp Leu Ala Lys Gln Arg Ala Asn Asn  
 405

<210> 122  
 <211> 1923  
 <212> DNA  
 <213> Streptococcus agalactiae

<400> 122  
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 attcctcatt atgagggtaa tctaactatt cacaatgata atagtgtga ttttacagag 180  
 aaggttactt accaatttga ttcgtcctat aatggacagt atgtcacgtt aggtacggcg 240  
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 <211> 640  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 123

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Gln	Phe	Asp	Ser	Ser	Tyr	Asn	Gly	Gln	Tyr	Val	Thr	Leu	Gly	Thr	Ala
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Gly	Lys	Leu	Ser	Asp	Asn	Phe	Asp	Ile	Asn	Asn	Lys	Pro	Gln	Val	Glu
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Val	Ser	Ile	Asn	Gly	Lys	Val	Arg	Lys	Val	Ser	Tyr	Gln	Ile	Glu	Asp
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Leu	Glu	Asp	Gly	Tyr	Arg	Leu	Lys	Val	Phe	Asn	Gly	Gly	Glu	Ala	Gly
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Asp	Thr	Val	Lys	Val	Asn	Val	Gln	Trp	Lys	Leu	Lys	Asn	Val	Leu	Phe
		130					135					140			
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Pro	Lys	Ile	Arg	Gln	Asn	Asn	Asn	Arg	Tyr	His	Leu	Thr	Ala	Phe	Asn
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Asn	Leu	Pro	Thr	Asn	Ser	Lys	Asn	Asn	Tyr	Lys	Lys	Lys	Ile	Glu	His
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Gln	Glu	Lys	Ile	Ile	Glu	Arg	His	Gly	Phe	Ile	Leu	Ser	Phe	Leu	Leu
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Arg	Ile	Leu	Leu	Pro	Ser	Phe	Phe	Ile	Ile	Val	Thr	Leu	Phe	Ile	Ser
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Ile	Arg	Val	Phe	Leu	Phe	Arg	Lys	Lys	Val	Asn	Lys	Tyr	Gly	Gln	Phe
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 Glu Glu Lys Lys Thr His Leu Ile Ser Gln Glu Gln Leu Ile Gln Ser  
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 Ile Leu Leu Asp Leu Ile Asp Arg Lys Val Leu Asn Tyr Asp Asp Asn  
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 370 375 380  
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 Lys Lys Gln His Lys Ala Ser Asp Leu Gln Asn Gln Met Arg Arg Arg  
 405 410 415  
 Gly Ser Asn Ala Leu Ser Arg Ile Thr Arg Leu Thr Arg Leu Ile Ser  
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 Lys Asp Asn Ile Asn Ser Leu Arg Arg Lys Gly Ile Ser Ser Pro Tyr  
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 Arg Lys Met Ser Ser Glu Glu Ser Lys Glu Leu Ser Arg Leu Lys Arg  
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 Phe Ser Tyr Leu Ser Pro Leu Ile Ser Phe Val Val Ile Ile Tyr Thr  
 465 470 475 480  
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 Ala Thr Leu Phe Gly Tyr Ala Asp Arg Val Glu Lys Val Leu Arg Val  
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 Asn Gln Ile Asp Ile Pro Glu Arg Phe Ala Asn Ile Asp Ser His Arg  
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 Phe Ala Ile Ser Val Asn Gln Ser Ser Asn His Phe Ser Thr Ile Thr  
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Glu Asp Val Ser His Ala Ser Asn Phe Ser Val Asn Ser Gly Gly Ser  
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Ser Gly Gly Phe Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Ala Phe  
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 <212> DNA  
 <213> Streptococcus agalactiae

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 gacaatgcta caccattagg caaagcgact tttgtgttaa aaaatgacaa tgataagtca 240  
 gaaacaagtc acgaaacggt agaggggttct ggagaagcaa cctttgaaaa cataaaacct 300  
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 gcattgaatc caataaatgg aaaagatggc cgaagagaga ttgctgaagg ttgggttatca 600  
 aaaaaaaatc caggggtcaa tgatctcgat aagaataaat ataaaattga attaactgtt 660  
 gagggtaaaa cactgttga aacgaaagaa cttaatcaac cactagatgt cgttgtgcta 720  
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<211> 903

<212> PRT

<213> Streptococcus agalactiae

<400> 125

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Gln Ile Pro Phe Gly Ile Leu Val Gln Gly Glu Thr Gln Asp Thr Asn  
 35 40 45

Gln Ala Leu Gly Lys Val Ile Val Lys Lys Thr Gly Asp Asn Ala Thr  
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Pro Leu Gly Lys Ala Thr Phe Val Leu Lys Asn Asp Asn Asp Lys Ser  
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Glu Thr Ser His Glu Thr Val Glu Gly Ser Gly Glu Ala Thr Phe Glu  
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Asn Ile Lys Pro Gly Asp Tyr Thr Leu Arg Glu Glu Thr Ala Pro Ile  
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Gly Tyr Lys Lys Thr Asp Lys Thr Trp Lys Val Lys Val Ala Asp Asn  
 115 120 125

Gly Ala Thr Ile Ile Glu Gly Met Asp Ala Asp Lys Ala Glu Lys Arg  
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Lys Glu Val Leu Asn Ala Gln Tyr Pro Lys Ser Ala Ile Tyr Glu Asp  
 145 150 155 160

Thr Lys Glu Asn Tyr Pro Leu Val Asn Val Glu Gly Ser Lys Val Gly  
 165 170 175

Glu Gln Tyr Lys Ala Leu Asn Pro Ile Asn Gly Lys Asp Gly Arg Arg  
 180 185 190

Glu Ile Ala Glu Gly Trp Leu Ser Lys Lys Asn Pro Gly Val Asn Asp  
 195 200 205

Leu Asp Lys Asn Lys Tyr Lys Ile Glu Leu Thr Val Glu Gly Lys Thr  
 210 215 220



Thr Val Glu Thr Lys Glu Leu Asn Gln Pro Leu Asp Val Val Val Leu  
 225 230 235 240  
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 245 250 255  
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 260 265 270  
 Thr Ser Asn Lys Asp Asn Arg Val Ala Leu Val Thr Tyr Ala Ser Thr  
 275 280 285  
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 370 375 380  
 Ser Asn Ala Arg Lys Lys Leu Ile Phe His Val Thr Asp Gly Val Pro  
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 435 440 445  
 Lys Gly Asp Gly Glu Ser Phe Lys Leu Phe Ser Asp Arg Lys Val Pro  
 450 455 460  
 Val Thr Gly Gly Thr Thr Gln Ala Ala Tyr Arg Val Pro Gln Asn Gln  
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 565 570 575  
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 595 600 605  
 Thr Asp Pro Met Gly Glu Met Ile Glu Phe Gln Leu Lys Asn Gly Gln  
 610 615 620  
 Ser Phe Thr His Asp Asp Tyr Val Leu Val Gly Asn Asp Gly Ser Gln  
 625 630 635 640  
 Leu Lys Asn Gly Val Ala Leu Gly Gly Pro Asn Ser Asp Gly Gly Ile  
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 Leu Lys Asp Val Thr Val Thr Tyr Asp Lys Thr Ser Gln Thr Ile Lys  
 660 665 670  
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 675 680 685  
 Asp Val Arg Leu Lys Asp Asn Tyr Ile Ser Asn Lys Phe Tyr Asn Thr  
 690 695 700  
 Asn Asn Arg Thr Thr Leu Ser Pro Lys Ser Glu Lys Glu Pro Asn Thr  
 705 710 715 720  
 Ile Arg Asp Phe Pro Ile Pro Lys Ile Arg Asp Val Arg Glu Phe Pro  
 725 730 735  
 Val Leu Thr Ile Ser Asn Gln Lys Lys Met Gly Glu Val Glu Phe Ile  
 740 745 750  
 Lys Val Asn Lys Asp Lys His Ser Glu Ser Leu Leu Gly Ala Lys Phe  
 755 760 765  
 Gln Leu Gln Ile Glu Lys Asp Phe Ser Gly Tyr Lys Gln Phe Val Pro  
 770 775 780  
 Glu Gly Ser Asp Val Thr Thr Lys Asn Asp Gly Lys Ile Tyr Phe Lys  
 785 790 795 800  
 Ala Leu Gln Asp Gly Asn Tyr Lys Leu Tyr Glu Ile Ser Ser Pro Asp  
 805 810 815  
 Gly Tyr Ile Glu Val Lys Thr Lys Pro Val Val Thr Phe Thr Ile Gln  
 820 825 830

Asn Gly Glu Val Thr Asn Leu Lys Ala Asp Pro Asn Ala Asn Lys Asn  
835 840 845

Gln Ile Gly Tyr Leu Glu Gly Asn Gly Lys His Leu Ile Thr Asn Thr  
850 855 860

Pro Lys Arg Pro Pro Gly Val Phe Pro Lys Thr Gly Gly Ile Gly Thr  
865 870 875 880

Ile Val Tyr Ile Leu Val Gly Ser Thr Phe Met Ile Leu Thr Ile Cys  
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Ser Phe Arg Arg Lys Gln Leu  
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<211> 1251  
<212> DNA  
<213> Streptococcus agalactiae

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ttcatttgta atgaatgtgt ggccttatca caagaaatta ttaaggaaga attagctgag 180  
gaagtactgg ctcatttagc agaagtacca aaacctaagg aactattaga aatattaaat 240  
caatatgttg tagggcaaga tcgtgctaaa cgtgcttttag cagttgctgt ctacaatcat 300  
tacaagcgtg ttagttatac cgagagtagt gacgatgatg tagatttgca aaaatccaac 360  
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agcettaatg taccgtttgc tattgcagat gcgacttcat tgaccgaagc aggatacgtt 480  
ggagaagatg ttgagaatat tcttcttaaa ttgattcaag ctgctgatta taatgtcgaa 540  
cgtgctgagc gtggtattat ctacgttgat gaaatagata aaattgctaa gaaaggcgaa 600  
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gctgataagg ctatcgagcg caagactggt gcacgtgggt tacgttctat tattgaagaa 1140  
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<210> 127  
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<212> PRT  
<213> Streptococcus agalactiae

<400> 127  
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 Leu Ser Gln Glu Ile Ile Lys Glu Glu Leu Ala Glu Glu Val Leu Ala  
 50 55 60  
 His Leu Ala Glu Val Pro Lys Pro Lys Glu Leu Leu Glu Ile Leu Asn  
 65 70 75 80  
 Gln Tyr Val Val Gly Gln Asp Arg Ala Lys Arg Ala Leu Ala Val Ala  
 85 90 95  
 Val Tyr Asn His Tyr Lys Arg Val Ser Tyr Thr Glu Ser Ser Asp Asp  
 100 105 110  
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 115 120 125  
 Ser Gly Lys Thr Phe Leu Ala Gln Thr Leu Ala Lys Ser Leu Asn Val  
 130 135 140  
 Pro Phe Ala Ile Ala Asp Ala Thr Ser Leu Thr Glu Ala Gly Tyr Val  
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 Gly Glu Asp Val Glu Asn Ile Leu Leu Lys Leu Ile Gln Ala Ala Asp  
 165 170 175  
 Tyr Asn Val Glu Arg Ala Glu Arg Gly Ile Ile Tyr Val Asp Glu Ile  
 180 185 190  
 Asp Lys Ile Ala Lys Lys Gly Glu Asn Val Ser Ile Thr Arg Asp Val  
 195 200 205  
 Ser Gly Glu Gly Val Gln Gln Ala Leu Leu Lys Ile Ile Glu Gly Thr  
 210 215 220  
 Val Ala Ser Val Pro Pro Gln Gly Gly Arg Lys His Pro Asn Gln Glu  
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 Phe Asp Gly Ile Glu Asp Leu Val Lys Gln Arg Leu Gly Glu Lys Val  
 260 265 270  
 Ile Gly Phe Gly Gln Thr Ser Arg Lys Ile Asp Asp Asn Ala Ser Tyr  
 275 280 285  
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 290 295 300  
 Glu Phe Ile Gly Arg Leu Pro Val Val Ala Ala Leu Glu Leu Leu Thr  
 305 310 315 320  
 Ala Glu Asp Leu Val Arg Ile Leu Thr Glu Pro Arg Asn Ala Leu Val  
 325 330 335

Lys Gln Tyr Gln Thr Leu Leu Ser Tyr Asp Gly Val Glu Leu Glu Phe  
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 Ile Met Phe Glu Ile Pro Ser Gln Glu Asp Val Thr Lys Val Arg Ile  
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 <212> DNA  
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 cttcccgatg caaattggaa accattaggt tggcatcaag tagctactaa tgaccattat 420  
 gggcatgcag tcgacaaggg gcatttaatt gcctatgctt tagctggaaa tttcaaagg 480  
 tgggatgctt ccgtgtcaaa tcctcaaaat gttgtcacac aaacagctca ttccaaccaa 540  
 tcaaatcaaa aaatcaatcg tggacaaaat tattatgaaa gcttagttcg taaggcggtt 600  
 gaccaaaaca aacgtgttcg ttaccgtgta actccattgt accgtaatga tactgattta 660  
 gttccatttg caatgcacct agaagctaaa tcacaagatg gcacattaga atttaattgt 720  
 gctattccaa acacacaagc atcacatact atggattatg caacaggaga aataacacta 780  
 aattaa 786

<210> 129  
 <211> 261  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 129  
 Met Lys Arg Leu His Lys Leu Phe Ile Thr Val Ile Ala Thr Leu Gly  
   1                                  5                                  10                                  15  
 Met Leu Gly Val Met Thr Phe Gly Leu Pro Thr Gln Pro Gln Asn Val  
                   20                                  25                                  30  
 Thr Pro Ile Val His Ala Asp Val Asn Ser Ser Val Asp Thr Ser Gln  
                   35                                  40                                  45

Glu Phe Gln Asn Asn Leu Lys Asn Ala Ile Gly Asn Leu Pro Phe Gln  
 50 55 60  
 Tyr Val Asn Gly Ile Tyr Glu Leu Asn Asn Asn Gln Thr Asn Leu Asn  
 65 70 75 80  
 Ala Asp Val Asn Val Lys Ala Tyr Val Gln Asn Thr Ile Asp Asn Gln  
 85 90 95  
 Gln Arg Leu Ser Thr Ala Asn Ala Met Leu Asp Arg Thr Ile Arg Gln  
 100 105 110  
 Tyr Gln Asn Arg Arg Asp Thr Thr Leu Pro Asp Ala Asn Trp Lys Pro  
 115 120 125  
 Leu Gly Trp His Gln Val Ala Thr Asn Asp His Tyr Gly His Ala Val  
 130 135 140  
 Asp Lys Gly His Leu Ile Ala Tyr Ala Leu Ala Gly Asn Phe Lys Gly  
 145 150 155 160  
 Trp Asp Ala Ser Val Ser Asn Pro Gln Asn Val Val Thr Gln Thr Ala  
 165 170 175  
 His Ser Asn Gln Ser Asn Gln Lys Ile Asn Arg Gly Gln Asn Tyr Tyr  
 180 185 190  
 Glu Ser Leu Val Arg Lys Ala Val Asp Gln Asn Lys Arg Val Arg Tyr  
 195 200 205  
 Arg Val Thr Pro Leu Tyr Arg Asn Asp Thr Asp Leu Val Pro Phe Ala  
 210 215 220  
 Met His Leu Glu Ala Lys Ser Gln Asp Gly Thr Leu Glu Phe Asn Val  
 225 230 235 240  
 Ala Ile Pro Asn Thr Gln Ala Ser Tyr Thr Met Asp Tyr Ala Thr Gly  
 245 250 255  
 Glu Ile Thr Leu Asn  
 260

<210> 130

<211> 621

<212> DNA

<213> Streptococcus agalactiae

<400> 130

atgaaaaact atcgaaaact tattgtacta ctacttctaa tcttttttgc catttttatg 60  
 ggagcatatg cttacacgca tattgttgaa aaaagatccc taactagcaa tactattgaa 120  
 aaaactctac ctgtggtaaa tcagattaag cctcaaacca ttaaagaata ccaaaattac 180  
 ttaactaagg tagctaaacg taatgttctt cctgtagaca ttcctcaggc attaaataat 240  
 gaaaaggtag aaattactgc tactgatggc atgcaaacat tcacttggaa tgataaaaat 300  
 aatcctaagc aaaagggttat cttctatggt catggaggat catatatcca tcaagcttcc 360

gaattacaat atattttttgt caataaacta gctaaaaaat tagatgcaaa agttgtcttt 420  
 cctattttacc ctaaagctcc tacatataat tatagtgatg ctatccccaa aattaaaaaa 480  
 ttataccaaa atacattagc tagcgtcaca tctcaciaaac agattatcct agtaggtgaa 540  
 agtgcaggcg gaggccttgc tttaggtatt gctgataacc ttgcacggag catatcaaac 600  
 aaccaaaga aattatttta a 621

<210> 131  
 <211> 206  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 131  
 Met Lys Asn Tyr Arg Lys Leu Ile Val Leu Leu Leu Leu Ile Phe Phe  
 1 5 10 15  
 Ala Ile Phe Met Gly Ala Tyr Ala Tyr Thr His Ile Val Glu Lys Arg  
 20 25 30  
 Ser Leu Thr Ser Asn Thr Ile Glu Lys Thr Leu Pro Val Val Asn Gln  
 35 40 45  
 Ile Lys Pro Gln Thr Ile Lys Glu Tyr Gln Asn Tyr Leu Thr Lys Val  
 50 55 60  
 Ala Lys Arg Asn Val Leu Pro Val Asp Ile Pro Gln Ala Leu Asn Asn  
 65 70 75 80  
 Glu Lys Val Glu Ile Thr Ala Thr Asp Gly Met Gln Thr Phe Thr Trp  
 85 90 95  
 Asn Asp Lys Asn Asn Pro Lys Gln Lys Val Ile Phe Tyr Val His Gly  
 100 105 110  
 Gly Ser Tyr Ile His Gln Ala Ser Glu Leu Gln Tyr Ile Phe Val Asn  
 115 120 125  
 Lys Leu Ala Lys Lys Leu Asp Ala Lys Val Val Phe Pro Ile Tyr Pro  
 130 135 140  
 Lys Ala Pro Thr Tyr Asn Tyr Ser Asp Ala Ile Pro Lys Ile Lys Lys  
 145 150 155 160  
 Leu Tyr Gln Asn Thr Leu Ala Ser Val Thr Ser His Lys Gln Ile Ile  
 165 170 175  
 Leu Val Gly Glu Ser Ala Gly Gly Gly Leu Ala Leu Gly Ile Ala Asp  
 180 185 190  
 Asn Leu Ala Arg Ser Ile Ser Asn Asn Gln Lys Lys Leu Phe  
 195 200 205

<210> 132  
 <211> 885  
 <212> DNA

<213> Streptococcus agalactiae

<400> 132

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ttgattctaa taacttccta tgggataata tctttatcac aaaaattgag ggaatttatt 60
atgaagttaa aacatattgt cttaggatta gccttaacaa cacttttagg agtcacattt 120
agtaatcaag aagtttcagc aagctcaact tcaagtaaag ttgttaaagt tgggtgttatg 180
accttttctg acactgaaaa agcacgttgg gataaaaattg aaaagctagt aggtgataaa 240
gctaaaaatca aatttacaga atttacagat tatacacaac caaatcaagc gacagccaat 300
aaggatgtgg atattaatgc ctttcaacat tacaatttct tagaaaactg gaataaggaa 360
aataagaaaa acttaattcc acttgaaaag acttacttag ctccaattcg tatctattct 420
gagaaggtaa aatctcttaa aaaattgaaa aaaggagcca ctattgcaat tccaaatgat 480
gcaacaaatg gtagccgtgc attgtatgtc cttcagtcag cagggtttaat caaattgaat 540
gtttctggta agaaggttgc aacagttgct aatatcacat ctaataaaaa ggatattaat 600
attcaggagt tagatgcgag tcaaacacca cgtgcactca aagatgtaga tgcagctatt 660
attaataata catacattga gcaagctaatt ttaaaacctt cagatgctat ctttgttgag 720
aaatcagata aaaattcaaa acaatggatt aatatcattg cgggacgtaa aaattggaaa 780
aagcaaaaga acgctaaagc tatccaagct atcttggatg cttatcacac agatgaagtg 840
aaaaaagtta tcaaagatac ttcagctgat attccacaat ggtaa 885

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<210> 133

<211> 294

<212> PRT

<213> Streptococcus agalactiae

<400> 133

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Met Ile Leu Ile Thr Ser Tyr Gly Ile Ile Ser Leu Ser Gln Lys Leu
  1             5             10             15

Arg Glu Phe Ile Met Lys Leu Lys His Ile Val Leu Gly Leu Ala Leu
      20             25             30

Thr Thr Leu Leu Gly Val Thr Phe Ser Asn Gln Glu Val Ser Ala Ser
      35             40             45

Ser Thr Ser Ser Lys Val Val Lys Val Gly Val Met Thr Phe Ser Asp
      50             55             60

Thr Glu Lys Ala Arg Trp Asp Lys Ile Glu Lys Leu Val Gly Asp Lys
      65             70             75             80

Ala Lys Ile Lys Phe Thr Glu Phe Thr Asp Tyr Thr Gln Pro Asn Gln
      85             90             95

Ala Thr Ala Asn Lys Asp Val Asp Ile Asn Ala Phe Gln His Tyr Asn
      100            105            110

Phe Leu Glu Asn Trp Asn Lys Glu Asn Lys Lys Asn Leu Ile Pro Leu
      115            120            125

Glu Lys Thr Tyr Leu Ala Pro Ile Arg Ile Tyr Ser Glu Lys Val Lys
      130            135            140

Ser Leu Lys Lys Leu Lys Lys Gly Ala Thr Ile Ala Ile Pro Asn Asp
      145            150            155            160

Ala Thr Asn Gly Ser Arg Ala Leu Tyr Val Leu Gln Ser Ala Gly Leu

```



165

170

175

Ile Lys Leu Asn Val Ser Gly Lys Lys Val Ala Thr Val Ala Asn Ile  
180 185 190

Thr Ser Asn Lys Lys Asp Ile Asn Ile Gln Glu Leu Asp Ala Ser Gln  
195 200 205

Thr Pro Arg Ala Leu Lys Asp Val Asp Ala Ala Ile Ile Asn Asn Thr  
210 215 220

Tyr Ile Glu Gln Ala Asn Leu Lys Pro Ser Asp Ala Ile Phe Val Glu  
225 230 235 240

Lys Ser Asp Lys Asn Ser Lys Gln Trp Ile Asn Ile Ile Ala Gly Arg  
245 250 255

Lys Asn Trp Lys Lys Gln Lys Asn Ala Lys Ala Ile Gln Ala Ile Leu  
260 265 270

Asp Ala Tyr His Thr Asp Glu Val Lys Lys Val Ile Lys Asp Thr Ser  
275 280 285

Ala Asp Ile Pro Gln Trp  
290

<210> 134

<211> 1350

<212> DNA

<213> Streptococcus agalactiae

<400> 134

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aatagggcag ccatgtatgg agcaaaagtc ctgttaattg aaggtggaca agtaggtgga 120  
acttggtgta acttaggttg tgtacctaaag aaaatcatgt ggtatgggtgc acaagtttct 180  
gagacactcc ataagtatag ttcagggttat ggttttgaag ccaataatct tagttttgat 240  
tttactactc taaaagctaa tcgcgatgct tacgtgcagc ggtctagaca gtcgtatgcc 300  
gctaattttg agcgtaattgg ggtcgaaaag attgatggat ttgctcgttt tattgataac 360  
catactattg aagtgaatgg tcagcaatat aaagctcctc acattactat tgcaacaggt 420  
ggacaccctc tttaccctga tattattgga agtgaacttg gtgagacttc tgatgatttt 480  
tttggatggg agaccttacc aaattctata ttgattgttg gggcgggcta tatcgcgga 540  
gaacttgctg gagtgggtaa tgaattaggc gttgaaaccc atcttgcat tagaaaagac 600  
catattctac gcggatttga tgacatggta acaagtggag ttatggctga aatggagaaa 660  
tcaggatatct ctttacatgc taacctatga cctaaatctc ttaaaccgca tgaagggtggc 720  
aagttgattt ttgaagctga aaatgggaaa acgcttgctg ttgatcggtg aatatgggct 780  
atcggccgtg gaccaaagt agacatggga cttgaaaata ccgatattgt tttaaatgat 840  
aaagattata tcaaaacaga tgaatttgag aatacttctg tagatggcgt gtatgctatt 900  
ggagatgtta atgggaaaat tgccttgaca ccggtagcaa ttgcagcagg tcgtcgctta 960  
tcagaaagac tttttaatca taaagataac gaaaaattag attaccataa tgtaccttca 1020  
gttattttta ctcaccctgt aattgggacg gtaggacttt cagaagcagc agctatcgag 1080  
caatttgga aagataatat caaagtctat acatcaactt ttacctctat gtatacggct 1140  
gttaccagta atcgccaagc agttaagatg aagctcataa ccctaggaaa agaggaaaaa 1200  
gttattgggc ttcattggtg ttggtatggt attgatgaaa tgattcaagg tttttcagtt 1260  
gctatcaaaa tgggggctac taaagcagac tttgatgata ctgttgctat tcacccaact 1320  
ggatctgagg aatttggtac aatgcgctaa 1350

<210> 135  
 <211> 449  
 <212> PRT  
 <213> Streptococcus agalactiae

<400> 135

Met	Ser	Asn	Gln	Tyr	Asp	Tyr	Ile	Val	Ile	Gly	Gly	Gly	Ser	Ala	Gly	1	5	10	15
Ser	Gly	Thr	Ala	Asn	Arg	Ala	Ala	Met	Tyr	Gly	Ala	Lys	Val	Leu	Leu	20	25	30	
Ile	Glu	Gly	Gly	Gln	Val	Gly	Gly	Thr	Cys	Val	Asn	Leu	Gly	Cys	Val	35	40	45	
Pro	Lys	Lys	Ile	Met	Trp	Tyr	Gly	Ala	Gln	Val	Ser	Glu	Thr	Leu	His	50	55	60	
Lys	Tyr	Ser	Ser	Gly	Tyr	Gly	Phe	Glu	Ala	Asn	Asn	Leu	Ser	Phe	Asp	65	70	75	80
Phe	Thr	Thr	Leu	Lys	Ala	Asn	Arg	Asp	Ala	Tyr	Val	Gln	Arg	Ser	Arg	85	90	95	
Gln	Ser	Tyr	Ala	Ala	Asn	Phe	Glu	Arg	Asn	Gly	Val	Glu	Lys	Ile	Asp	100	105	110	
Gly	Phe	Ala	Arg	Phe	Ile	Asp	Asn	His	Thr	Ile	Glu	Val	Asn	Gly	Gln	115	120	125	
Gln	Tyr	Lys	Ala	Pro	His	Ile	Thr	Ile	Ala	Thr	Gly	Gly	His	Pro	Leu	130	135	140	
Tyr	Pro	Asp	Ile	Ile	Gly	Ser	Glu	Leu	Gly	Glu	Thr	Ser	Asp	Asp	Phe	145	150	155	160
Phe	Gly	Trp	Glu	Thr	Leu	Pro	Asn	Ser	Ile	Leu	Ile	Val	Gly	Ala	Gly	165	170	175	
Tyr	Ile	Ala	Ala	Glu	Leu	Ala	Gly	Val	Val	Asn	Glu	Leu	Gly	Val	Glu	180	185	190	
Thr	His	Leu	Ala	Phe	Arg	Lys	Asp	His	Ile	Leu	Arg	Gly	Phe	Asp	Asp	195	200	205	
Met	Val	Thr	Ser	Glu	Val	Met	Ala	Glu	Met	Glu	Lys	Ser	Gly	Ile	Ser	210	215	220	
Leu	His	Ala	Asn	His	Val	Pro	Lys	Ser	Leu	Lys	Arg	Asp	Glu	Gly	Gly	225	230	235	240
Lys	Leu	Ile	Phe	Glu	Ala	Glu	Asn	Gly	Lys	Thr	Leu	Val	Val	Asp	Arg	245	250	255	
Val	Ile	Trp	Ala	Ile	Gly	Arg	Gly	Pro	Asn	Val	Asp	Met	Gly	Leu	Glu				

260	265	270
Asn Thr Asp Ile Val Leu Asn Asp Lys Asp Tyr Ile Lys Thr Asp Glu		
275	280	285
Phe Glu Asn Thr Ser Val Asp Gly Val Tyr Ala Ile Gly Asp Val Asn		
290	295	300
Gly Lys Ile Ala Leu Thr Pro Val Ala Ile Ala Ala Gly Arg Arg Leu		
305	310	315 320
Ser Glu Arg Leu Phe Asn His Lys Asp Asn Glu Lys Leu Asp Tyr His		
	325	330 335
Asn Val Pro Ser Val Ile Phe Thr His Pro Val Ile Gly Thr Val Gly		
	340	345 350
Leu Ser Glu Ala Ala Ala Ile Glu Gln Phe Gly Lys Asp Asn Ile Lys		
	355	360 365
Val Tyr Thr Ser Thr Phe Thr Ser Met Tyr Thr Ala Val Thr Ser Asn		
	370	375 380
Arg Gln Ala Val Lys Met Lys Leu Ile Thr Leu Gly Lys Glu Glu Lys		
385	390	395 400
Val Ile Gly Leu His Gly Val Gly Tyr Gly Ile Asp Glu Met Ile Gln		
	405	410 415
Gly Phe Ser Val Ala Ile Lys Met Gly Ala Thr Lys Ala Asp Phe Asp		
	420	425 430
Asp Thr Val Ala Ile His Pro Thr Gly Ser Glu Glu Phe Val Thr Met		
	435	440 445

Arg

<210> 136  
 <211> 1317  
 <212> DNA  
 <213> Streptococcus agalactiae

<400> 136  
 atgagtatca aaaaaagtgt gattgggtttt tgcctcgaag ctgcagcatt atcaatgttt 60  
 gcttgtgtag acagtagtca atctgttatg gctgccgaga aggataaagt cgaaattacg 120  
 tgggtgggctt ttccaacctt tactcaagaa aaggctaagg atggagtagg tacttatgag 180  
 aaaaaagtca tcaaggcttt tgaaaagaaa aatcctaata taaaagtaaa actagagaca 240  
 attgatttca catctggacc tgaaaaaatc actacagcaa ttgaagcagg gacagcacct 300  
 gatgtgcttt ttgatgcacc agggcgaatt attcaatatg gtaaaaatgg taaattagca 360  
 gatttgaatg atttattttac agaccaattt attaaggatg tcaataataa gaacatcatt 420  
 caagcttcta agtctggcga taaagcctac atgtatccaa taagttctgc cccattttat 480  
 atggcgttca ataaaaaat gcttaaagat gcaggagttt tgaaacttgt aaaagaaggt 540  
 tggactacta gtgattttga aaaagtacta aaagcactaa aaaataaagg ctatacacca 600  
 ggttcattct ttgcaaacgg gcaaggagga gatcaaggac cacgtgcatt ttttgcta 660

ctttatagtg ctccaataac agataaagaa gtaacaaaat ataccactga cactaaaaat 720  
 tctgtaaaat caatgaaaaa aatagttgaa tggattaaga aaggctactt gatgaatggg 780  
 tctcagtatg atggctcagc tgacattcaa aacttcgcca atggacaaac tgctttcact 840  
 atcctatggg ctccagctca accaaaaact caagcaaaat tattagagtc aagtaaagtg 900  
 gattaccttg aagtgccatt cccatcagaa gatggaaaac cagatttaga ataccttgtt 960  
 aatggttttg cggctcttaa taataaagat gaaaacaaag taaaagcctc taagaaattt 1020  
 atcactttta ttgctgatga taaaaaatgg ggacccaaaag atgttatacg tacaggtgct 1080  
 ttcccagtta gaacatcatt tggggatctt tataaagggtg ataaacgtat gatgaagatt 1140  
 tcaaaatgga ctcaatatta ttcaccatat tacaacacta tcgatggatt ttctgaaatg 1200  
 agaaccttat ggttcccaat ggttcaatct gtatccaatg gtgatgaaaa accagcagat 1260  
 gctttgaaag actttactca aaaagcaaat gataaccatta aaaaagcagc taaataa 1317

<210> 137

<211> 438

<212> PRT

<213> Streptococcus agalactiae

<400> 137

Met Ser Ile Lys Lys Ser Val Ile Gly Phe Cys Leu Glu Ala Ala Ala  
 1 5 10 15

Leu Ser Met Phe Ala Cys Val Asp Ser Ser Gln Ser Val Met Ala Ala  
 20 25 30

Glu Lys Asp Lys Val Glu Ile Thr Trp Trp Ala Phe Pro Thr Phe Thr  
 35 40 45

Gln Glu Lys Ala Lys Asp Gly Val Gly Thr Tyr Glu Lys Lys Val Ile  
 50 55 60

Lys Ala Phe Glu Lys Lys Asn Pro Asn Ile Lys Val Lys Leu Glu Thr  
 65 70 75 80

Ile Asp Phe Thr Ser Gly Pro Glu Lys Ile Thr Thr Ala Ile Glu Ala  
 85 90 95

Gly Thr Ala Pro Asp Val Leu Phe Asp Ala Pro Gly Arg Ile Ile Gln  
 100 105 110

Tyr Gly Lys Asn Gly Lys Leu Ala Asp Leu Asn Asp Leu Phe Thr Asp  
 115 120 125

Gln Phe Ile Lys Asp Val Asn Asn Lys Asn Ile Ile Gln Ala Ser Lys  
 130 135 140

Ser Gly Asp Lys Ala Tyr Met Tyr Pro Ile Ser Ser Ala Pro Phe Tyr  
 145 150 155 160

Met Ala Phe Asn Lys Lys Met Leu Lys Asp Ala Gly Val Leu Lys Leu  
 165 170 175

Val Lys Glu Gly Trp Thr Thr Ser Asp Phe Glu Lys Val Leu Lys Ala  
 180 185 190

Leu Lys Asn Lys Gly Tyr Thr Pro Gly Ser Phe Phe Ala Asn Gly Gln  
 195 200 205

Gly Gly Asp Gln Gly Pro Arg Ala Phe Phe Ala Asn Leu Tyr Ser Ala  
 210 215 220  
 Pro Ile Thr Asp Lys Glu Val Thr Lys Tyr Thr Thr Asp Thr Lys Asn  
 225 230 235 240  
 Ser Val Lys Ser Met Lys Lys Ile Val Glu Trp Ile Lys Lys Gly Tyr  
 245 250 255  
 Leu Met Asn Gly Ser Gln Tyr Asp Gly Ser Ala Asp Ile Gln Asn Phe  
 260 265 270  
 Ala Asn Gly Gln Thr Ala Phe Thr Ile Leu Trp Ala Pro Ala Gln Pro  
 275 280 285  
 Lys Thr Gln Ala Lys Leu Leu Glu Ser Ser Lys Val Asp Tyr Leu Glu  
 290 295 300  
 Val Pro Phe Pro Ser Glu Asp Gly Lys Pro Asp Leu Glu Tyr Leu Val  
 305 310 315 320  
 Asn Gly Phe Ala Val Phe Asn Asn Lys Asp Glu Asn Lys Val Lys Ala  
 325 330 335  
 Ser Lys Lys Phe Ile Thr Phe Ile Ala Asp Asp Lys Lys Trp Gly Pro  
 340 345 350  
 Lys Asp Val Ile Arg Thr Gly Ala Phe Pro Val Arg Thr Ser Phe Gly  
 355 360 365  
 Asp Leu Tyr Lys Gly Asp Lys Arg Met Met Lys Ile Ser Lys Trp Thr  
 370 375 380  
 Gln Tyr Tyr Ser Pro Tyr Tyr Asn Thr Ile Asp Gly Phe Ser Glu Met  
 385 390 395 400  
 Arg Thr Leu Trp Phe Pro Met Val Gln Ser Val Ser Asn Gly Asp Glu  
 405 410 415  
 Lys Pro Ala Asp Ala Leu Lys Asp Phe Thr Gln Lys Ala Asn Asp Thr  
 420 425 430  
 Ile Lys Lys Ala Ala Lys  
 435

<210> 138

<211> 40

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 138

cgagatctga tatctcacaacacagataacg gcgtaaataag

40

<210> 139

<211> 43

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 139

gaagatcttc cccgggatca caaacagata acggcgtaaa tag

43

<210> 140

<211> 42

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 140

cgagatctga tatccatcac aaacagataa cggcgtaaag ag

42

<210> 141

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 141

cgggacctt atggacctga atcagcggtg tc

32

<210> 142

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 142

ggatgcttg tttcaggtg atc

23

<210> 143

<211> 82

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 143

catgatatcg gtacctcaag ctcatatcat tgtccggcaa tgggtggggc tttttttggt 60  
ttagcggata acaatttcac ac 82

<210> 144

<211> 81

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 144

gcggatcccc cgggcttaat taatgtttaa acactagtcg aagatctcgc gaattctcct 60  
gtgtgaaatt gttatccgct a 81

<210> 145

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 145

cgccagggtt ttcccagtcg cgac 24

<210> 146

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 146

tcaggggggc ggagcctatg 20

<210> 147

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 147

tcgtatgttg tgtggaattg tg 22

<210> 148

<211> 26  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

<400> 148  
tccggctcgt atgttggtg gaattg

26

<210> 149  
<211> 43  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

<400> 149  
aagtatcaga tctgatatct cacaaacaga taacggcgta aat

43

<210> 150  
<211> 46  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

<400> 150  
aagtatcaga tcttccccgg gatcacaaac agataacggc gtaa

46

<210> 151  
<211> 45  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

<400> 151  
aagtatcaga tctgatatcc atcacaaaca gataacggcg taa

45

<210> 152  
<211> 24  
<212> DNA  
<213> Staphylococcus aureus

<400> 152  
tcacaaacag ataacggcgt aa

24

<210> 153



<211> 40  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Primer  
  
 <400> 153  
 cgggatccgc caccatgacc acttctcaag ctgttttagc 40  
  
 <210> 154  
 <211> 31  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Primer  
  
 <400> 154  
 ttgcggccgc acgattatca acaaagttct g 31  
  
 <210> 155  
 <211> 41  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Primer  
  
 <400> 155  
 cggatccgcc accatggcta ctcatattgg aagttaccag c 41  
  
 <210> 156  
 <211> 35  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Primer  
  
 <400> 156  
 ttgcggccgc agggtttatt tgttgaagtg tcttg 35  
  
 <210> 157  
 <211> 40  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Primer  
  
 <400> 157  
 cggatccgcc accatgtatc tatatcattt accaatgccc 40

<210> 158  
<211> 34  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

<400> 158  
ttgcggccgc tttatgtata gaaacagcag tccc

34

<210> 159  
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<220>  
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<400> 159  
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42

<210> 160  
<211> 34  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

<400> 160  
ttgcggccgc aagagcaaatt tttcgatatct cctc

34

<210> 161  
<211> 35  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

<400> 161  
cggatccgcc accatgattg ttggacacgg aattg

35

<210> 162  
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<220>  
<223> Description of Artificial Sequence: Primer

<400> 162  
ttgcggccgc tttttcttcc tccaaaataa cactagc 37

<210> 163  
<211> 39  
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<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

<400> 163  
cggatccgcc accatggcga ctaaagagtt aggtgtag 39

<210> 164  
<211> 39  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence: Primer

<400> 164  
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<210> 165  
<211> 39  
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<220>  
<223> Description of Artificial Sequence: Primer

<400> 165  
cgggatccac catgtatacg agtttacaac caaatcatg 39

<210> 166  
<211> 34  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence: Primer

<400> 166  
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<210> 167  
<211> 42  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence: Primer

<400> 167  
cggatccgcc accatgtgtc aaatgaatag tgaacataaa ag 42

<210> 168  
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<212> DNA  
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<220>  
<223> Description of Artificial Sequence: Primer

<400> 168  
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<210> 169  
<211> 39  
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<220>  
<223> Description of Artificial Sequence: Primer

<400> 169  
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<210> 170  
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<212> DNA  
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<220>  
<223> Description of Artificial Sequence: Primer

<400> 170  
ttgcggccgc tgatttacca gtttggaaga gtgc 34

<210> 171  
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<212> DNA  
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<220>  
<223> Description of Artificial Sequence: Primer

<400> 171  
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<210> 172

<211> 31  
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 <211> 41  
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 <400> 173  
 cggatccgcc accatgatag agtggattca aacacattta c 41  
  
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 <211> 33  
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 ttgcggccgc tttatgactc aagcgacgtg tta 33  
  
 <210> 175  
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 <400> 175  
 cggatccgcc accatggagt tagtaattag agatattcgt aag 43  
  
 <210> 176  
 <211> 35  
 <212> DNA  
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 <400> 176  
 ttgcggccgc cttgtcatat tcattctcct tcaac 35

<210> 177  
 <211> 43  
 <212> DNA  
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 <223> Description of Artificial Sequence: Primer  
  
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 <210> 178  
 <211> 37  
 <212> DNA  
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 <210> 179  
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 <223> Description of Artificial Sequence: Primer  
  
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 <210> 181  
 <211> 42  
 <212> DNA  
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<400> 181  
cggatccgcc accatgggtg aaaccaaga taccaatcaa gc 42

<210> 182  
<211> 30  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence: Primer

<400> 182  
ttgcggccgc aacacctggt gggcgtttgg 30

<210> 183  
<211> 35  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

<400> 183  
cggatccgcc accatggctg ggaatcgtaa taacg 35

<210> 184  
<211> 32  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence: Primer

<400> 184  
ttgcggccgc agccgtctct aaaacaggct tg 32

<210> 185  
<211> 37  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence: Primer

<400> 185  
cggatccgcc accatgcttc caacgcagcc gcaaaac 37

<210> 186  
<211> 41  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence: Primer

<400> 186  
ttgcggccgc atttagtggt atttctcctg ttgcataatc c 41

<210> 187  
<211> 37  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence: Primer

<400> 187  
cgggatccac catgtacacg catattgttg aaaaaag 37

<210> 188  
<211> 33  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence: Primer

<400> 188  
ttgcggccgc aaataatttc ttttggtgtg ttg 33

<210> 189  
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<212> DNA  
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<220>  
<223> Description of Artificial Sequence: Primer

<400> 189  
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<210> 190  
<211> 33  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence: Primer

<400> 190  
ttgcggccgc ccattgtgga atatcagctg aag 33

<210> 191



<211> 36  
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 <400> 191  
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 <210> 192  
 <211> 33  
 <212> DNA  
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 <400> 192  
 ttgcggccgc gcgcattgta acaaattcct cag 33  
  
 <210> 193  
 <211> 33  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
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 <400> 193  
 cgggatccac catggctgcc gagaaggata aag 33  
  
 <210> 194  
 <211> 34  
 <212> DNA  
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 <220>  
 <223> Description of Artificial Sequence: Primer  
  
 <400> 194  
 ttgcggccgc attatttagc tgctttttta atgg 34  
  
 <210> 195  
 <211> 39  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Primer  
  
 <400> 195  
 cgggatccac catgtgtcag gttgtttatg caagttttc 39

<210> 196  
 <211> 37  
 <212> DNA  
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 <220>  
 <223> Description of Artificial Sequence: Primer  
  
 <400> 196  
 ttgcgccgcg tttactaatt gataaagagc aacttcg 37  
  
 <210> 197  
 <211> 39  
 <212> DNA  
 <213> Artificial Sequence  
  
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 <223> Description of Artificial Sequence: Primer  
  
 <400> 197  
 ggggtaccgg ccaccatggc tgaagtaatt tcaggaagt 39  
  
 <210> 198  
 <211> 39  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Primer  
  
 <400> 198  
 cggaattccg ttaatcctct ttttttctta gaaacagat 39  
  
 <210> 199  
 <211> 17  
 <212> DNA  
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 <220>  
 <223> Description of Artificial Sequence: Primer  
  
 <400> 199  
 cgggatccgc caccatg 17  
  
 <210> 200  
 <211> 10  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> Description of Artificial Sequence: Primer

<400> 200  
ttgcggccgc

10

<210> 201  
<211> 28  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

<400> 201  
atggaaaaaa atacttgga aaaattac

28

<210> 202  
<211> 27  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

<400> 202  
ctattttgtt ttagcgatgt ctttacc

27

<210> 203  
<211> 26  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

<400> 203  
atgtcaaaac aaaaagtaac ggcaac

26

<210> 204  
<211> 30  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

<400> 204  
ttatttatgg ccaataccat aagttaattg

30

<210> 205  
<211> 30  
<212> DNA  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 205

atgaaaaaag ttttttttct catggctatg

30

<210> 206

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 206

ttacttcaac tgttgataga gcacttcc

28

<210> 207

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 207

ttgttcaatt ttatagggtt tagaacttgg

30

<210> 208

<211> 24

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 208

ttaattttca ttgcgtctca aacc

24

<210> 209

<211> 31

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 209

atgacaaaaa aacttattat tgctatatta g

31

<210> 210

<211> 27  
<212> DNA  
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<220>  
<223> Description of Artificial Sequence: Primer

<400> 210  
ttaacgatta tcaacaaagt tctgtac

27

<210> 211  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

<400> 211  
atgatacgcc agtttttaag agaa

24

<210> 212  
<211> 27  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

<400> 212  
ttatttatgt atagaaacag cagtccc

27